Inclusive Collaboration:

The Use of the Push-In Model of Intervention and Growth Mindset Approach in the General Mathematics Classroom

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ABSTRACT

This thesis examines the effectiveness of providing in classroom (push-in model) support for learners struggling with mathematics. Using a collaborative teaching model between the classroom teacher and the Learning Assistant Resource Teacher, two aspects were examined in children from grades four to seven: 1) Change in Growth Mindset as measured by a growth-mindset self-rating scale pre and post intervention and students' reflections and 2) The experiences of teachers during the implementation of a collaborative push-in model intervention. The children who received the intervention showed important changes in their mindset as suggested by the increasing scores in the growth mindset questionnaires from pre- to post-intervention, and the difference was statistically significant as revealed by a paired sample *t*-test. Their growth mindset was corroborated by their journals entries. Examination of the teachers' collaborative experience revealed that collaborations facilitated curriculum alignment, timely language scaffolding in math, and variation within the learning environment. It also improved curriculum scope, sequence, and learning continuity. Moreover, it afforded flexibility in timing and organization of the learning environment. The importance of this study directly relates to the issues of inclusion and providing effective services to students.

Keywords: collaborative teaching, inclusive education, mathematics, growth mindset, push-in student support.

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Andrea MacKenzie

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Introduction

The main purpose of this study is to examine the effectiveness of providing mathematical interventions for struggling learners of mathematics within the classroom setting (push-in model). The push-in model provides support for students by a specialist teacher inside the classroom environment. Using a collaborative teaching model between the classroom teacher and the Learning Assistant Resource Teacher, two aspects were examined in children from grades four to seven: change in students' Growth Mindset and the collaborative experiences of the teachers involved.

The importance of this study directly relates to how educators can deliver effective services to students; as well as, issues surrounding inclusion. Historically, students with exceptionalities were segregated from the general classroom, "contained" in one institution, but not included (Moore, 2016). Students with exceptionalities were traditionally educated by a specialized teacher in a resource room within the same school but were not included in the general classroom (Towle, 2015). In the school district where I work, the term Learning Assistant Resource Teacher (LART) is used; however, in this paper LART will also encompass the following terms: Special Education Teacher, or Resource Teacher, which appear in the literature. The roles and responsibilities of the specialist teacher regardless of which name is being used is to case manage, plan, and implement student services for children with exceptionalities. LARTs assist in developing the Inclusive Educational goals of students and monitor progress in the goal completion. The LART also monitors the social/emotional needs of students by offering strategies for self-regulation and develop behaviour plans with staff.

The current model of support provided by LARTs is the pull-out model of intervention. The LART commonly pulls students from the general classroom environment to receive interventions in another room, directly taught by the LART. As schools are applying a full inclusion approach to learning, there is a contradiction between promoting inclusion and the practice of removing students from the general classroom to receive specialized support. This study aims at addressing the issue of providing support services by using an alternate approach (push-in model) to promote inclusion.

The second issue that the study addresses is Growth Mindset, and specifically the Fixed Mindset of students in regards to mathematics. When students approach mathematics with a Fixed Mindset they will often have an "internal monologue that is focused on judgements" (Dweck, 2016, p.215). As a teacher/LART, I often hear students with a Fixed Mindset say things such as: "I am not good at math", "My mom/dad is not good at math so I'm not", "I like art not math", "Why would I try, I am just going to fail anyway?" Students with Fixed Mindsets, often frame their judgements as internal statements that create barriers to learning (Dweck, 2016; Boaler, 2016). The research study hypothesizes that if students can change their mindsets, especially struggling learners, then they will be more open to learn and succeed in mathematics by potentially changing how they view themselves as a learner; therefore, changing the way they internalize the concept of failure.

Theoretically, the study is situated within two major frameworks: inclusion; specifically, how student services are currently being provided to students with exceptionalities and Growth Mindset. I briefly examine each of them below.

In North America, the practice of inclusion has become an important component of special education services (Moore, 2016). The push-in model has been gaining attention by educators who wish to bridge the gap between special education and the general classroom teacher. Imbedded within the framework of inclusion is the push-in model and collaborative teaching. This study explores how professionals and experts can work together in the general mathematics classroom with a collaborative teaching and push-in model of support.

In my dual role as a participant and researcher, I bring an autobiographical lens to this study. As such, I acknowledge bias in regards to personal school history and philosophy of teaching. As a student in elementary school, I was involved in a pull-out program for speech and language intervention. I have vivid memories at the age of five of being pulled out of my classroom and learning speech sounds with a specialist in a separate classroom. I have fond memories of the specialist teacher and enjoyed our time together; however, I disliked being removed from the class. I felt like the other children knew that I had to leave because something was "wrong with me" and I remember the transition back to class was difficult. I always felt like I was missing something when I left the room, and I was often confused when I returned because I missed a story or part of a lesson. The pull-out program did improve my speech sound identification; however, it also left me with the feeling that I was not as smart as the other students in my class.

Reducing stigma through celebrating diversity and inclusion is at the core of my teaching philosophy. I strongly agree with Shelley Moore (2016) that "Inclusion is not about a place in time; it is about place with purpose" (p.23). If supports are provided to all students inside the classroom, then there is no stigma associated with receiving

support. The place of learning with collaborative partnerships has a clear purpose of creating an inclusive setting, and the diversity of learning is then normalized. I believe in a community of learners and professionals that work together to collaborate for a common purpose and vision to benefit their learning community.

The populations that were studied included students in grades four to seven at a public rural school in the Interior of British Columbia. Students from the target school in grades four to seven have been experiencing low academic achievement scores on assessments in mathematics, as evidenced by school report cards of student progress and results from the 2017 Foundation Skills Assessment. In response to the low achieving math levels of the students, the school has made numeracy an important school goal that all professionals will be addressing. I am the Learning Assistant Resource Teacher at the school where the study took place, and my role is to provide support services to all students including students who have been identified as struggling in mathematics.

Along with providing support within an inclusive environment, students need to believe that they can succeed. The Growth Mindset theory (Dweck, 2016) lends itself as a promising framework to shift struggling students' mental perspectives on their ability to succeed. Individuals can either have a Fixed Mindset, where a person believes their ability is fixed, or a Growth Mindset where changeability and growth is developed through learning opportunities (Dweck, 2016). The concept of Growth Mindset can be directly applied to mathematics because when students' mindsets become more flexible they are more willing to re-examine their learning potential as not one of ability but one of continuous growth (Boaler, 2016). A possible benefit of identifying the Growth Mindset of learners is that it provides information for the teachers and professionals

working with the students' insight into the student's self-esteem and feelings towards themselves and mathematics.

The following sections of the research study will be organized based on a literature review of the Inclusive Collaboration model of the Learning Assistance Resource Teacher and the general classroom teacher working together to provide student services, an overview of mathematic disabilities, followed by a discussion of Growth Mindset. The methodology and procedure sections will include the research methods and research design, and finally, there will be a discussion of the findings, limitations, recommendations for future research and a conclusion.

Literature Review

The literature review of the research study is organized around five main components: 1) the emergence of inclusion in British Columbian schools, 2) the pull-out and push-in models of student services, 3) collaborative teaching, 4) mathematical competency; and 5) Growth Mindset and education. All of the components, when bridged together, create the foundation for the research study and links together how a push-in model, collaborative teaching, mathematics, and Growth Mindset, can all be applied to inclusive education.

The Emergence of Inclusion in British Columbian Schools

In British Columbia, the Ministry of Education is the governing body that regulates the practices, policies, and procedures of how education is delivered to all students (Special Education, 2006). The Ministry of Education policy manual outlines all information including the definitions of disabilities, programming guidelines, assessment, and reporting. During the 1980's the move towards inclusion was implemented in British Columbia when students with exceptionalities were beginning to be included in general education; however, it was "integration-groups of students housed together" not inclusion (Moore, 2016, p.13). Students with exceptionalities were segregated from the general classroom, "contained" in one institution, but not included in the general classroom. (Moore, 2016). Students were educated by a specialized teacher in a resource room within the same school and remained segregated from their peers and school community (Towle, 2015).

It was not until 2012, when the Moore case (Moore vs. British Columbia) proved in court for the first time that school districts have the responsibility to provide access to

education to students with exceptionalities, that the push for full inclusion in schools took momentum (Stegemann & Aucoin, 2018). The Moore case proved to be a pivotal point in Canadian history in regards to inclusion rights. Parents now had a precedent set with the Moore case that provided them opportunities to go to court and demand inclusion for all children with exceptionalities. In North America, the practice of inclusion has become an important component of special education services, but we do not have full inclusion-yet (Moore, 2016). Full inclusion involves the school and school districts supporting the teachers and learners in the regular classroom (Carr, 2016). In full inclusion, teachers receive additional training and time for professional collaboration in order to design supports for specific learners but accessible to all learners in the classroom (Carr, 2016; Moore, 2016).

As a Learning Assistant Resource Teacher in British Columbia, the Ministry of Education governs me; however, how I deliver special education services to students can be flexible with the support of administration. In order to incorporate inclusive and differentiated supports for students it is important to establish an environment/community in classrooms that are inclusive to all learners and professionals (Brownlie & King, 2011). One way of building supports within the classroom is to include specialized teachers, including LARTs, into the classroom environment and to have all learners remain in the classroom to receive interventions. To elaborate on how the LART can be included in the classroom environment, I have researched the common student support practices of the pull-out and push-in models, as well as, co-teaching/collaborative learning. In order to incorporate inclusive and differentiated learning supports for students, which enhance a school that is safe and inclusive to all learners, I have

researched the common student support service practices of the "pull-out" and "push-in" models, as well as, co-teaching/collaborative learning.

The Pull-out and Push-in Model of Student Services

Two models of intervention are employed by educators to support students who need support: the pull-out and the push-in models. A pull-out model of providing special education services can be defined as any program that removes "students from the general classroom to special classes or separate rooms to receive services" (Swartz, n.d). It is standard practice that "students continue to be pulled out of the classroom for various services such as counseling, speech therapy, occupational therapy, physical therapy", and academic support (Barton, 2016, p.2). Students work in a separate area for individualized or small group instruction with the purpose of targeting instruction to the student's learning needs (Bean, Cooley, Eichelberger, Lazar & Zigmond, 1991; Fernandez & Hines, 2016). In British Columbia, the Learning Assistant Resource Teacher (LART) is responsible for providing support for students including academic interventions for reading, mathematics, and behaviour support programs (Moore, 2016). Reading and mathematics groups are determined by "achievement", special needs designation and can include students from various classrooms (Allington & Cunningham, 2007). There are some benefits of the pull-out program, but it is also important to acknowledge the consequences that a pull-out program may have to the student's learning and their self-esteem (Allington & Cunningham, 2007; Barton, 2016, Bean, Cooley, Eichelberger, Lazar & Zigmond, 1991; Beninghof, 2012; Fernandez & Hynes, 2016; Moore, 2016; Shanahan, 2008; Swartz, n.d; Woodward & Talbert-Johnson, 2009 & Zigmond, 2003).

The main advantage for students receiving a pull-out model of student support is that students receive direct instruction from a specialist teacher in a small classroom setting (Barton, 2016). A separate teaching environment may also be less distractible for students than a general classroom and they could feel less embarrassed to make mistakes and become more involved in discussions compared to a larger classroom (Barton, 2016; Woodward & Talbert-Johnson, 2009). Additionally, there can also be instructional benefits to teachers in a pull-out model. The LART can plan specific lessons for learners with exceptionalities, provide more attention to individual students, and the LART can group students from multiple classrooms based on ability level and provide targeted interventions (Woodward & Talbert-Johnson, 2009).

Having students removed from the general classroom for specialized instruction by a learning specialist can create challenges involving coordination and planning, curriculum fragmentation, and student stigmatization (Allington & Cunningham, 2007; Bean et.al, 1991; Barton, 2016; Fernandez & Hynes, 2016; Moore, 2016; Shanahan, 2008; Swartz, n.d; Woodward & Talbert-Johnson, 2009). When students are pulled-out of the general classroom, general teachers and the Special Education Teacher often have little collaboration and planning due to “time crunches” and when planning does take place it is more for assessment purposes than lesson planning (Woodward & Talbert-Johnson, 2009). Fernandez & Hynes (2016) reason that the lack of collaboration between teachers during pull-out programming could be a direct result of the general teacher’s perception that they “did not have the expertise, resources, time, and training to implement inclusion effectively”, which is why teachers trust the interventions put in place by the Special Education Teacher (p.35).

In relation to the lack of collaboration between the specialist and classroom teacher students who participate in a pull-out program receive "curriculum fragmentation" (Allington & Cunningham, 2007; Bean et al., 1991; Barton, 2016; Fernandez & Hines, 2016). Allington and Cunningham (2007) characterize the curriculum the student receives from the specialist teacher as the "other organized" curriculum that includes intervention programs that are not part of the general classroom; furthermore, "special education teachers were often unfamiliar with the regular curriculum and rarely used regular classroom curriculum materials" (p.193). This results in students, receiving two programs.

The most important factor when considering a pull-out program is the social/emotional effects it may have on the self-esteem of the student who is removed from the classroom (Barton, 2016; Fernandez & Hynes, 2016; Moore, 2016). Peers in the classroom will also notice the absences of students who are receiving pull-out instruction from the classroom, and the student themselves may feel stigmatized for receiving instruction with the special education teacher (Barton, 2016; Fernandez & Hynes, 2016; Woodward & Talbert-Johnson, 2009). In contrast to the pull-out model, the push-in model allows students who need support to stay in their classroom with their peers.

Inclusion is the "concept of teaching to the diversity of all" by providing student services inside the classroom instead of having the students pulled out to receive services (Moore, 2016). The push-in model of special education services enhances the educational experiences of all learners because a specialized teacher is in the classroom available to help anyone while providing interventions to those who require targeted supports (Woodward & Talbert-Johnson, 2009). Having the Special Education Teacher

inside the general classroom can promote inclusion, as well as, professional collaboration (Woodward & Talbert-Johnson, 2009). This professional collaboration may address the need for extra support that most teachers experience when working with children with diverse learning needs.

Teachers in "general education are expected to cope with students with diverse needs" (Gal, Schreur & Engel-Yehger, 2010, p.89); however, they may not always be supported sufficiently or even have the necessary professional knowledge to support all learners in the classroom. Having a trained professional in addition to the classroom teacher can provide professional development opportunities for general teachers (Schnellert & Butler, 2014; Woodward & Talbert-Johnson, 2009, p.190). The main advantages of having a LART providing student services in the general classroom is that it decreases curriculum fragmentation since students do not lose transitional time and it reduces the stigma for those students of being pulled out of the general classroom (Allington & Cunningham, 2007; Barton, 2016; Bean et. al., 1991; Fernandez & Hynes, 2016; Shanahan, 2008; Woodward & Talbert-Johnson, 2009). Instruction becomes "collaborative problem solving" when professionals work together and the students' needs are identified and interventions are provided in the classroom, not as a separate program (Woodward & Talbert-Johnson, 2009). Shanahan (2008) speculates that one of the main reasons for the failure of many pull-out programs is that when the curriculum materials are used outside of the classroom, it is "unlikely to help the struggling students learn what they need to do well in the classroom" (p.114). One way that curriculum fragmentation can be avoided is through a collaborative/co-teaching model.

Collaborative Teaching

Co-teaching or collaborative teaching can be defined as "the sharing of instruction by a general education teacher and a Special Education Teacher, or another specialist in a general class that includes students with disabilities", and it is a "relatively recent application" to special education pedagogy (Friend, Cook, Hurley-Chamberlain & Shamberger, 2010, p.9). Co-teaching may present like the push-in class model of providing student support but differs "because both educators are simultaneously engaged in the instructional process" (Beninghof, 2012, p.8). In this research study, the method of instruction meets the criteria of co-teaching defined by Murawski (2008), because I was involved in co-planning and in aspects of co-assessing; however, it is also important to note that my time in the classroom is limited.

Both the push-in and co-teaching models allow for collaboration and cooperation between teachers, the difference lies in that with the push-in model the professionals are not both actively engaged with students for the entire length of a designated time in the general classroom (Beninghof, 2012). In a push-in model, professionals providing student services spend only the time needed in the classroom to provide interventions to students who would have been pulled out of the classroom. The push-in model can be an integrated part of co-teaching depending on how both the general classroom teacher and the LART decide to design instruction.

The main benefit of co-teaching is that it promotes inclusion of students and creates a professional relationship between teachers for the purpose of addressing how to effectively service students with exceptionalities in the general classroom (Brownlie & King, 2011; Friend, Cook, Hurley-Chamberlain & Shamberger, 2010). The needs of the

designated student(s) can be met; as well, all students have the potential to share the benefit of additional support in the classroom (Beninghof, 2012; Friend, Cook, Hurley-Chamberlain & Shamberger, 2010). Co-teaching is becoming more and more of a necessity as a response to the complexities of teaching to diverse learners in a classroom (Friend, Cook, Hurley-Chamberlain & Shamberger, 2010). The next section discusses various ways to implement a co-teaching model.

There are many ways of delivering instruction using a co-teaching model. One of the most effective ways of co-teaching is to approach co-teaching in the form of station teaching or skills group model (Allington & Cunningham, 2007; Beninghof, 2012; Friend, Cook, Hurley-Chamberlain & Shamberger, 2010). In the station teaching and skills group models, students are distributed into small groups, and teachers can directly lead group instruction and directly teach target skills such as a new literacy or numeracy concept (Beninghof, 2012; Friend, Cook, Hurley-Chamberlain & Shamberger, 2010)

Mathematical Competency

Throughout the history of mathematics education, there has been a definite shift in the understanding of what constitutes strong mathematical abilities (Gersten & Chard, 1999). Mathematical education has changed in teaching practices from the rote, direct teaching of mathematical facts, to a new concept of visualization, skill construction, computation strategies, memory retrieval, and an overall understanding of numeracy (Brownlie & King, 2011; Butterworth, 2005; Calkins, 2003; Emerson & Babtie, 2010, 2014; Gersten & Chard, 1999; Mighton, 2007). In contemporary understanding of mathematical abilities, a student who exhibits strong mathematical abilities does not just recall facts, they can problem solve, extend their thinking, apply their knowledge, and

engage in the inquiry process analytically and creatively (Brownlie & King, 2011; Boaler, 2016; Emerson & Babtie, 2010, 2014). In analyzing how a student learns mathematics, also comes a realization of how others do not learn the concepts of mathematics and the unfortunate consequences of living with poor numeracy skills.

Mathematical skills are essential life skills. Mathematical competency is needed to count money, budget, secure employment, perform problem-solving skills, and it directly influences other aspects of daily life, which ultimately affects quality of life (Butterworth, 2010; Rourke & Conway, 1997; Vukovic & Siegel, 2010). Unfortunately, almost "60 percent of North American adults have mathematical skills below levels considered necessary for coping with everyday life and work and advance in society" (Vukovic & Siegal, 2010, p.25). If a student does not acquire the necessary mathematical skills for academic achievement, they may struggle in their daily lives, which is why timely intervention is crucial, and is the rationale behind focusing on mathematics for this research study (Butterworth, 2010; Vukovic & Siegal, 2010).

Identification and referral of students experiencing challenges to developing mathematical competency. Many factors contribute to challenges students have when developing mathematical competency. Vukovic and Siegel (2010) address the persistent mathematical difficulties children exhibit in a three-year longitudinal study with children from first through fourth grade. The longitudinal study affirms that students who are struggling in mathematics exhibit difficulties in working memory, processing speed, visual-spatial abilities, phonological processing, and lack a general mathematical background (p.26-27). The study assessed mathematical improvement by a series of academic assessments and compared the results with a series of ANOVAS in order to

determine which academic skills resulted in achievement growth and the cognitive processes of the learners. The results from the study found that the lack of "crystallized knowledge", defined as numerical reasoning, rather than the number series and mastery of math facts contributed significantly to the challenges in mathematical competency. Linking previously taught patterns, problem solving, and accessing a variety of strategies becomes essential to the process of learning, not memorizing mathematics. Vukovic and Seigel state that "formal mathematics instruction is not enhancing children's mathematics" (p.36).

The research from Vukovic and Siegal (2010) is important to this research study as the study presents alternative approaches to learning mathematics. Students are not pulled-out of the classroom to receive formal mathematical instruction based on facts; instead, students are differentiated in their mathematical instruction within the classroom environment while being exposed to the language and learning of their peers.

The research study reported in this thesis focused on students in grades four to seven. By grade four, students are taught the fundamentals of mathematical concepts and the skills become increasingly difficult based on the mastery of the basic skills. It is also expected that by grade four, students will be able to demonstrate concepts of numeracy such as one to one correspondence, quantity, be able to manipulate sets of things, and use counting strategies (Butterworth, 2005; 2010). If there are any lagging skills in mathematical concepts, it is typically in grade three or four that persistent problems in mathematics present such as working memories issues, visual-spatial, and language difficulties (Vukovic & Siegal, 2010). As a result, a child with math exceptionalities may become fatigued quickly when presented with a new learning task and can demonstrate

difficulties retrieving and mentally manipulating numerical quantities and recalling number sense (Morsanyi & Devine, 2014; Nobes & Szucs, 2013; Sousa, 2015). If a teacher notices any lagging skills in mathematics a referral could be made to the Learning Assistant Resource Teacher at the school. The LART would then meet with the school and parents in order to understand the learning challenges of the student. School based assessments and possibly assessments by a School Psychologist could be recommended in order to determine mathematical exceptionalities. It is important to provide interventions as soon as lagging skills present in order for students to become successful math learners and to avoid the consequences of living with poor numeracy skills. It is also important to address the social/emotional factors that contribute to becoming a successful math learner, which can include the learner's mindset.

Growth Mindset and Education

Dweck's (2016) research discusses how the psychology of mindsets directly influences success. There are two different types of mindsets. The Fixed Mindset is the belief that ability is set by perceived "smartness" and Growth Mindset is a belief that ability is developed through learning (Boaler, 2013; Dweck, 2016). The concept of mindsets has a direct relationship with education and learning. When students have a Fixed Mindset, they internalize failures; in contrast, the student with the Growth Mindset views failures as an opportunity to learn, and Growth Mindsets for teachers is an awareness of how teachers communicate ability, especially in the subject area of mathematics (Boaler, 2013; Mighton, 2007). The education system has traditionally relied on standardized test scores to predict achievement not internal motivation or the process of thinking (Boaler, 2016; Hochanadel & Finamore, 2015). Mathematical

knowledge through assimilation and accumulation of facts instead of learning for meaning is more ability based than acknowledging competency through attitude and motivation (Saragih & Napitupulu, 2015). Success in academics could be influenced more by beliefs, goals, persistence, and adaptive responses than 'ability' in order for all students to achieve at all levels in the classroom (Boaler, 2016; Hochanadel & Finamore, 2015; Mangels, Butterfield, Lamb, Good & Dweck, 2016; Moser, Shroder, Heeter, Moran & Lee, 2011).

This research study focused on how the LART can model Growth Mindset by praising processes of mathematics instead of ability. Several studies have illustrated how improving teacher communication with students regarding success and failure can have a positive impact on self-esteem and academic success (Chin, 2012; Boaler, 2013; Brougham& Kashubeck-West, 2018; Gersten & Chard, 1999; Dweck, 2016; DeBacker, Heddy, Kershen, Crawson, Looney & Goldman, 2018). Starting feedback messages with "I like the way you" and adding specific details about the learning process builds the belief that the student's process is what matters, not the fact that they have a correct or incorrect response (Brougham & West, 2018). I used the suggested phrases from Growth Mindset research to model a Growth Mindset approach in the general mathematics classroom.

The projects length is also reflective of research that implies that even a "one shot" intervention of a Growth Mindset approach to learning could have a positive impact on learning. Although the studies involving a short Growth Mindset intervention have not demonstrated positive replication, there is growing literature to suggest that a longer

intervention may have a greater impact (DeBacker, Heddy, Kershen et al., 2018). For this reason, the period of a twelve-week intervention was chosen for the research study.

Methods

This mix-methods research, primarily qualitative with a small quantitative exponent, used a Participatory Action Research design as described in Creswell (2015) and included both qualitative and quantitative research questions, data collection tools, processes, and analyses. This section provides further elaboration on criteria for selection and recruitment of participants, the nature of the math and Growth Mindset intervention, the Push-in Collaborative Model, the tools and strategies for data collection and analyses, and ethical considerations.

The research design of the study is grounded in the practice of Participatory Action Research. This research study adhered to the qualities of a Participatory Action Research Design because it is practical and collaborative. The practical component of the research is that it reflects commonly accepted practices in delivering student services and not only explains the practices but critically examines the practices for the purpose of making improvements to education (Newton & Burgess, 2008). Participatory Action Research was also chosen because it directly relates to both the research focus and the job description and responsibilities of a LART. It is my responsibility as a LART to provide the best educational opportunities for all students and to work with the general teachers effectively. As the main researcher and a participant in this Participatory Action Research project, the decisions about different aspects of the study were in consultation with the participating teachers. There was equal collaboration between the LART and the general classroom teacher through continuous reflection and analysis of current practices and action plans were discussed in relation to the needs of the students.

The Participatory Action Research approach (Cresswell, 2015; Newton & Burgess, 2008) provided a perfect match for the intention of the study –to assess the effectiveness of the push-in model of inclusion. A Participatory Action Research project is designed to examine current practices that are commonly accepted in education, and has a purpose for not only improving practice but to critically examine and interpret components of education (Newton & Burgess, 2008). The push-in model requires the Learning Assistant Teacher and the general teacher to work together to provide support within the general classroom instead of the LART pulling students out of the general classroom to provide support. The push-in model fits within the framework of Participatory Action Research because there is an emphasis on collaboration and transparency between the participants and the researcher (Creswell, 2015; Newton & Burgess, 2008). Another key element of a Participatory Action Research Design is that the researcher is also a participant, and the main goal of the research is to provide an action plan- a plan to adjust teaching and improve practice. As such, the action plan for this research project, which centered around the push-in model through collaborative teaching and Growth Mindset for a mathematics intervention was developed and adjusted throughout the study through on-going consultation with all participating teachers. Educational practices evolved as the research project was implemented. The action plan throughout this project was developed, implemented and adjusted collaboratively through lesson planning sessions among the participating teachers, and it is summarized and discussed in the Findings and the Discussion sections of this thesis report.

In a Participatory Action Research, there are multiple sources of data (Cresswell, 2015). The first part of the methods section explores the quantitative data collection

instruments and analyses techniques and then addresses the qualitative component. The specific quantitative questions are: 1) Are there significant changes in Growth Mindset for children participating in the push-in math intervention? 2) Are there significant differences in Growth Mindset between children struggling with math and their peers? It was expected that the gap between the two groups would narrow by the end of the intervention. In order to measure Growth Mindset, a survey was given at the beginning of the research project and the same survey was administered at the end of the research project.

The qualitative component aims at answering the following question: What are the experiences of teachers and students in a push-in model of intervention for students struggling with mathematics? The main aspects of the qualitative component consists of journals from the teachers and researcher, student math reflection sheets (administered twice), and final interview questions of the teacher participants.

Process

In the beginning of the school year, the LART and the classroom teachers conducted individual meetings to discuss students that were identified as being struggling learners in mathematics. The students were identified as struggling learners because they were not meeting curriculum expectations for their grade level based on assignments, tests, and participation in classroom activities.

Once the students needing additional math support were identified, in class support interventions were instructed, twice a week for approximately 20 minutes each time for twelve weeks. The LART designed the interventions in consultation with the classroom teacher and provided the interventions directly in the classroom. The

researcher also used fidelity treatment by journaling every day after the exact time the researcher spent with the students who received the intervention. This journaling kept the researcher on track with the purpose and focus of the intervention.

Participants

The students that participated in the study were from grade 4 to grade 7 and there was a mix of both females and males in the classes. This age range was chosen because early interventions of any learning challenges are more effective for the growth and development of children. In total there were 45 student participants in the study and 15 of them, those struggling with math, were part of the intervention group. The student participants were recruited by a letter that was sent home to their guardians by the researcher asking for voluntary participation in the study.

The participants of the intervention groups for mathematics were chosen by the teachers in consultation with the LART in regards to the need of mathematic intervention. An important factor in the demographics of the participants is that all participants are part of a rural community. The rural community has approximately 250 students in total from grades Kindergarten to grade 12. There are two schools within the community with the Elementary housing students from Kindergarten to grade 4 and the elementary/secondary school includes students in grade 5 to grade 12. The research study included one class (grade 4) from the elementary building, and two classes from the elementary/secondary building (grade 5 and grade 6/7). I am the LART for both buildings and provide student services to students in both buildings.

All the teachers of the participating students were invited to participate in the research study. Three teachers agreed to participate. Data from these three teachers only

was included in the study. All of the teachers are female and varied in the grades they teach and years of teaching experience. The grade 4 teacher has taught for over five years, the grade 5 teacher is a new teacher with less than five years of experience, and the grade 6/7 teacher is a seasoned teacher with almost twenty years of experience.

Sampling Approaches of the Participants

The sampling of the participants included a mixture of convenience purposeful sampling combined with extreme case and opportunistic sampling (Cresswell, 2015). The purposeful sampling of the teachers included all general teachers but varied in the grades they taught and years of experience. The opportunistic sampling participant included the Social Studies teacher who was not part of the general math teachers; however, as the opportunity of collaboration was extended in the schools, they ended up having an important part of the research study.

The students were purposefully chosen because of their grades and the fact that they were students in the school I am a LART. The intervention group of participants had the commonality that they all were struggling learners; however, they had diverse needs, ability, and personal and physical characteristics. They could be considered extreme sample participants also because they do not represent typical learners; rather they are learners performing below expectations. In addition, a grade 8 student was recruited through opportunistic sampling and became an important highlight in the research study. His participation illustrated the value of collaboration and extended relationships outside the classroom.

The Intervention

The mathematic intervention of the research study included two specific aspects: providing mathematic intervention to identified learners needing support and the collaborative nature of the LART with the general teacher in the classroom. An additional goal of the intervention was to include a Growth Mindset approach as a teaching strategy to create positive beliefs surrounding mathematics. The researcher worked with the students in the intervention group in the general classroom environment for twenty minutes, twice a week, for the duration of twelve weeks. The following sections provide details into the specific teaching strategies the researcher used when teaching the intervention group and how the push-in collaborative teaching model was used in each classroom.

Growth mindset. The students that were chosen to participate in the intervention group were struggling learners, and I wanted to provide learning opportunities that were built on success. I told the students that everyone was going to learn and everyone was going to succeed. At the beginning of the research study, the students were a bit hesitant in what I meant about them "all succeeding", but when I introduced the first tasks, which were a departure from traditional direct instruction and rote learning math tasks, they started to become engaged in learning. In the classrooms, I focused on reducing paper-based tasks and introduced more games and manipulatives as learning opportunities. With games, students were engaged in learning opportunities that I could facilitate, and the students could work together (Boaler, 2016). By focusing on strategies and the students' thinking, when there was an incorrect response we discussed the process as

growth in learning. I reinforced that mistakes were a learning opportunity and focused on the successful parts of the process- then guided the student to the "correct" response.

Frontloading struggling learners on the concepts being taught in class was used in all of the classrooms. Re-teaching and pre-teaching was the main instructional strategy used in the intervention groups. When frontloading students, re-teaching previously taught concepts was also used in all classrooms. I strongly agree with Bellert (2015) that re-teaching concepts provides a "second-chance opportunity for both teachers, and students, as teachers can refine and target instruction and students can try again to learn the concept" (p.4). Re-teaching focusses on the process of learning without worrying about failure; therefore, increasing the opportunity for an increase in Growth Mindset.

Pre-teaching new concepts to students has the same purpose as re-teaching concepts. The students were introduced to the concept in a small group, instead of with the rest of the class, with the purpose of feeling confident about the topic or concept when the teacher introduced it to the whole class.

In all of the intervention groups, a key teaching component to the lessons was the use of positive language. I used many phrases and suggestions from Boaler (2016) when praising students and encouraging a Growth Mindset. Instead of telling students they were "smart", I focused my praise on specific strategies they used in their learning. I used the word "thinking" when phrasing my responses such as "I like the way you showed your thinking by…", and acknowledged various ways of finding solutions. If students did not execute a correct response, I would highlight what they did do correctly and draw more attention to their process and thinking than the step they had incorrect. Students were encouraged to talk about their strategies and thinking and have number

talks associated with different math problems which encouraged diversity of thought and process (Boaler, 2016). I also encouraged the students to think of themselves as "mathematicians" in order to encourage them to dispel the myth that mathematics is about ability (Boaler, 2016; Mighton, 2007).

There were also opportunities in the research studies where students from the intervention group became leaders. I used games to pre-teach the intervention group, but then had the students in the intervention group become the students who taught the general learners in the classroom. The games where the students from the intervention group demonstrated leadership included: Place Value Battleship, a dice game that involved strategic planning of building the largest number, and a game called Slap Card where students have to identify an odd or even number by slapping the card first (Researcher Notes, Lesson 2, Gr.6/7; Researcher Notes, Lesson 3, Gr.6/7; Researcher Notes, Lesson 11, Gr.5). These games were based on basic skill building, but also encouraged Growth Mindset by shifting the roles of learners from the dependent learners to leaders.

In order to implement the Growth Mindset approach in the general mathematics classroom, I used a push-in model of support and worked collaboratively with each general classroom teacher planning lessons that met the needs of the students.

Push-in collaborative teaching model. The inclusive nature of the study was further explored through the collaborative teaching model between the Learning Assistance Resource Teacher/researcher and the general teacher in each classroom. The teachers reflected regularly on the experience of collaboration as part of the qualitative research component of this study. Instead of having a separate intervention

curriculum outside the general classroom, teachers were actively involved in communicating the needs of their students in order to provide the most suitable interventions. The students receiving math intervention were not pulled out of the classroom; instead, mathematical interventions took take place within the classroom hoping to decrease the social/emotional negative effects that being removed from the classroom may have on the student's self-esteem (Barton, 2016; Fernandez & Hynes, 2016; Moore, 2016).

The collaborative teaching model in each classroom was adapted to each of the students and teachers' needs. In the grade 4 classroom, the teaching style of the teacher was more of a lecture and paper based model of instruction. An intervention model that worked for the grade 4 classroom was a station model where students had a designated table in the back of the room where they received direct instruction (Beninghof, 2012). The station model worked well with the natural flow of the classroom.

In the grade 5 classroom, students were engaged in group learning activities on the days that I was available in the classroom. Students were involved in a warm up group that we called "Brain Booster" groups and we worked on re-teaching a specific skill. It was natural during the Brain Booster groups to work with the intervention group. I could adapt the material to the needs of the students and we had the smallest group. This classroom also had the smallest number of students (15), which made the intervention group even less noticeable. After the warm up group, students would work in rotation groups where there were four activities to work on for the remainder of the class. The teacher also used a timer of twenty minutes to ensure pacing.

The grade 6/7 classroom required more organization on how to design the intervention group without the students feeling stigmatized. The classroom teacher and I had several discussions on what would work best for the classroom. The classroom environment had a back room with a table that students could use for a quiet space to work. There was also another space that was available for students to use just outside the classroom. Between the grade 6/7 classroom is a glass sliding door that opens to the library to provide an 'extended classroom'. It was very motivating for the students to work at the round table in the library, just outside of the glass door in the classroom. Since the library table was a desirable work area, we decided that the table would be a very positive space for students in the intervention group.

The students started the intervention ten to fifteen minutes at the end of their silent reading time and only missed the beginning of the classroom lesson. The purpose of the timing was to be as discrete as possible and all of the students welcomed the interruption of silent reading to begin working on skills with the LART. The intervention group worked mostly on skill building games that they would then introduce to the class and pre-teaching and re-teaching concepts were also effective strategies for this grade level.

Data Collection Methods and Analyses

Quantitative data was collected through the Growth Mindset Survey (see Appendix A) given to all students at the beginning of the project and at the end of the project. I used the Growth Mindset Questionnaire designed by Boucher (2016). Boucher is an Educator in the United States of America who uses the Growth Mindset Questionnaire as part of professional development and as a guide to general teachers of

mathematics who are interested in Growth Mindset. The purpose of the Growth Mindset Questionnaire is to assess differences across study groups. It contains fifteen questions, and each question corresponds with a value of 0 = not true, 1= a little true or 2 = very true. The maximum score a student can achieve in this survey is 30. This instrument presented an inter-item reliability of $\alpha = .69$ at pre-test and $\alpha = .59$ at post-test. . A high alpha value (.70 or more) suggests a high internal consistency. There was a lower inter-reliability of the alpha value in the post-test compared to the pre-test suggesting that there was less consistency in how the various items in the scale captured growth mindset at the end of the intervention.

The data from the Growth Mindset Survey was organized and coded in an Excel document. The nominal codes were sorted by gender (male, female), intervention group or comparison, and grades. The data in the excel document was cleaned of any errors and then exported to SPSS for statistical analyses. Quantitative data was analyzed by paired and independent sample *t*-tests to examine whether there was a significant change in Growth Mindset within groups from pre- to post-intervention and whether the growth was significantly different between students who are struggling learners in mathematics and the general learners in the classroom.

Qualitative data was collected using reflection journals from the teachers and students. Students who received interventions completed a My Math Reflections sheet at the beginning of the research project and again at the end of the research project (see Appendix I). The students were given 4 questions to answer: 1) I am doing well with…2) I still need help with…3) Math connection I made today…4) My math goal…. Math reflections questions were based on the mathematical mindset work of Boaler (2016).

The math reflection sheets were given twice during the research study, once at the beginning and another at the end of the study. These students' self-assessments were analyzed by examining the wording students use to describe goals and general positive and negative emotions referring to mathematics, which identified whether a student was demonstrating a Growth Mindset or Fixed Mindset.

The researcher and the teacher participants also completed reflective journals throughout the research project. The focus of the journals was to reflect on the collaborative process of providing in class support for students. Teachers were expected to complete weekly journal entries that highlighted their experiences of participating in the research study. The teachers were not given a template for the reflective journals; rather, teachers were encouraged to write individual thoughts without a frame.

At the end of the twelve weeks of research, all journals were submitted to the researcher and the classroom teachers. To establish trustworthiness, the researcher used member checks to verify statements and the meaning of the teacher participant quotes in their journals. Teachers also participated in a semi-structured interview with the researcher at the end of the study (see Appendix H).

Qualitative data obtained from the journals was analyzed using thematic coding. Coding was inductive, not pre-determined and data was triangulated for accuracy, transferability, and consistency through a peer check.

Ethical Considerations

All students in grades 4 to 7 were invited to participate, but only those authorized through parental consent were asked to complete the reflection journals and the Growth Mindset Questionnaires, which are components specific to the proposed research. All

students completed the Growth Mindset Questionnaire, but only data from those whose parents gave authorization were included in the analyses and reports deriving from the proposed research. All students identified as needing additional support in mathematics received support, but only data from those who gave consent was used in the study. Approximately 20-25% of each class was in the intervention group. There were no risks to the participants in the study beyond the normal stressors that school may pose on children; in fact, risks were minimized to students who received math support because their learning was facilitated through the intervention in the general classroom.

This research project has been approved by Thompson Rivers University REB (see certification of approval attached in Appendix B), it has also been approved by the Superintendent of School District 73 (see Appendix C), and by the school Principal (see Appendix E) of the schools where the study took place. I also reviewed the official policy of the school board regarding research being conducted in classrooms (see Appendix D). Before beginning the study, I requested consent from the teachers and parents. Participants were recruited by informed consent letters sent home to the parents/guardians (see attached consent forms in Appendix F). In the written consent form to the parents/guardians, there was a section that informed the parents that students had the right to withdraw at any point of the study. None of the students withdrew from the study. In the first meeting with students, I affirmed assent by explaining to the students that I had consent of their parents; however, they also had the right to not participate in the research, and it would not reflect on their academic records (marks). Adult participants were also informed of the right to voluntarily withdraw from the study

at any point of the project, but before the final report (see attached consent form Appendix G).

In this thesis report and all future publications student names have been removed and participant names (teachers and students) were replaced with a pseudo name or a code to adhered to strict confidentiality and privacy. Any other identifying information, such as the location of the study and the name of the school, was removed to protect the confidentiality of all participants in the study. All data material (questionnaires and reflective journals) is stored in a locked filing cabinet with the only key belonging to the researcher. All electronic data was passcode protected. It will be kept for a minimum of five years and will be destroyed once the study has been completed and published. There was no monetary compensation for participating in the research study.

Fairness and equity was addressed in the research by the consideration that the research will involve members of a vulnerable group. Students in the general classroom may be identified as having special learning needs/disabilities, which would qualify the students as members of a vulnerable group. All learners with consent were included in the study as the study involves inclusive learning in the general classroom. The whole purpose of the study is to improve the learning support services for struggling learners and children with exceptionalities.

As a researcher and participant in this Participatory Action Research project, there could be a perceived conflict of interest in the research study. The researcher is a teacher and the participants are the students (minors) which does create a power imbalance and expectation that the learner will participate in all learning activities. As a researcher and a teacher, there can be the perception of the teacher having power over the student. To

mitigate the perception of the power imbalance I was not responsible for grading the students for their report card. Monitoring student progress, collaboration and discussions with the general teachers are all within the regular duties of the Learning Assistant Resource Teacher. The researcher also kept a regular reflection journal to self-check and make sure there is no bias.

Findings

The main purpose of this study was to examine the effectiveness of providing mathematical interventions for struggling learners of mathematics within the classroom setting (push-in model). The LART worked collaboratively with the classroom teachers, and the participatory action research was analyzed by both quantitative and qualitative research methods to investigate the research questions. The quantitative research questions addressed the questions: 1) Are there significant changes in Growth Mindset for the children participating in the push-in intervention? 2) Are there significant differences in Growth Mindset between children struggling in mathematics compared to their peers? The Qualitative component aimed at answering the following question: What are the experiences of the teachers and students in a push-in model of intervention for students struggling in mathematics? The findings section of the research project is organized by the research questions.

Growth Mindset Changes Across Time and Differences Across Groups

Growth Mindset Questionnaire was given to all students, once at the beginning of the research study and again at the end of the intervention. Once the data was collected, I used descriptive statistics to present the scores of the students in the intervention group as compared with their peers no receiving intervention. Table 1 shows raw and percentage scores of the Growth Mindset Questionnaire administered before and after the intervention. The results provided evidence to answer the question of whether there were significant differences in Growth Mindset between children struggling in mathematics that were part of an intervention group compared to their peers whom were the control group.

Table 1

Pre- and Post-Intervention Growth Mindset Questionnaire

	N	Pre-Intervention Questionnaire		Post-Intervention Questionnaire	
		Mean (SD) Raw score	Mean (SD) %	Mean (SD) Raw score	Mean (SD) %
Comparison Group	30	16.83 (4.4)	56.11 (14.7)	17.57 (3.9)	58.56 (13)
Intervention Group	15	16.07 (5.2)	53.56 (18.9)	18.93 (3.8)	63.11 (12.7)
Combined	45	16.58 (4.6)	55.26 (15.6)	18.02 (3.9)	60.07 (12.9)

As can be gleaned from Table 1, both groups showed changes in their Growth Mindset from the pre-intervention questionnaire to the post-intervention questionnaire. The control group shows a 2% increase and the intervention group a 9% increase.

To examine whether differences within and across groups were statistically significant, a series of *t*-test analyses were run. Before running these analyses, data was examined to confirm that all assumptions were met. Frequency analyses with skeweness and kurtosis values indicate that data was normally distributed and skeweness and kurtosis were within acceptable ranges. The skeweness scores for the comparison group was -1.11 at pre-intervention and -0.91 at post-intervention. The skeweness for the intervention group was -2.07 at pre-intervention and -0.81 at post-intervention. The kurtosis scores for the comparison group was -0.19 at pre-intervention and -0.60 at post-intervention. The kurtosis for the intervention group was 0.87 at pre-intervention and -0.86 at post-intervention.

To examine whether there were significant differences in scores between the two groups before and after the intervention, two independent sample *t*-test were run. As

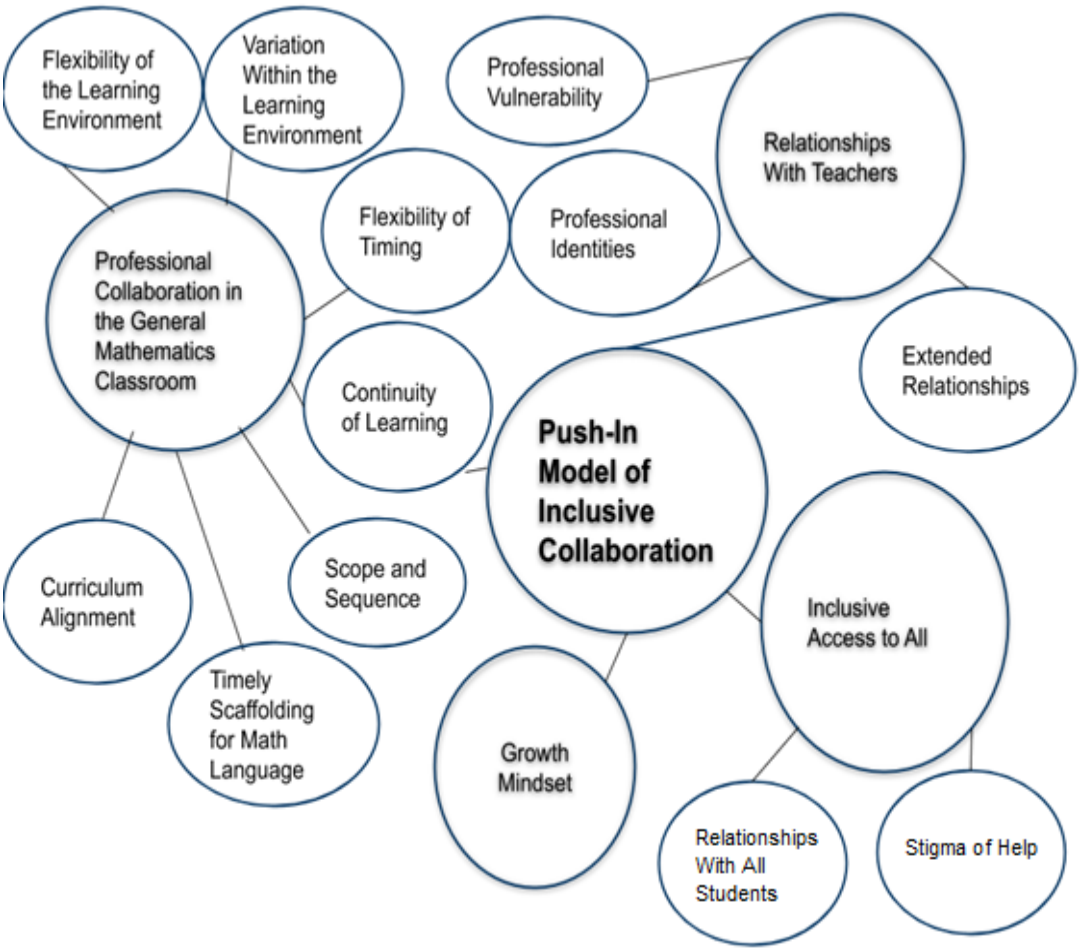
expected from the information provided by the descriptive statistics, there were no statistically significant differences between the two groups, $t(24) = .483$, $p = .633$ (with equal variances not assumed) for pre-intervention and $t(43) = -1.116$, $p = .270$ (with equal variances assumed) for post-intervention. To examine whether the growth from pre-intervention to post-intervention made by each group was significant two paired sample *t*-tests were run. These analyses revealed that the comparison group did not make significant gains, $t(29) = -.928$, $p = .361$ from pre to post intervention, whereas the gains by the intervention group ($MD = -2.87$) were statistically significant, $t(14) = -1.889$, $p = .080$.

Qualitative Data: Experience of the Push-In Model for Participants

I collected qualitative data from the teacher participants, the students in the intervention groups, and from the LART/researcher. The data collections methods consisted of teacher journals, the researcher journal, final interview responses from the teachers, and student self-reflections. The purpose of the qualitative data was to provide information to answer the question: What are the experiences of teachers and students in a push-in model of intervention for students struggling in mathematics? Four major categories emerged from the qualitative research data: 1) Professional collaboration in the general classroom with the subthemes of curriculum alignment, scope and sequence, timely scaffolding for math language, flexibility of the learning environment, flexibility of timing, and continuity of learning, 2) Relationships with teachers and the subthemes of professional vulnerability, professional identities and extended relationships, 3) Inclusive access to all with the subthemes of relationships with all students and stigma of

help, and 4) Growth Mindset (see Figure 1). These categories with their corresponding subthemes will be discussed next.

Figure 1 Qualitative Themes and Subthemes



Professional collaboration in the general mathematics classroom. Having two trained professionals in the general classroom provided opportunities to instantly collaborate instead of planning a meeting. As the grade 6/7 teacher commented in her final interview "having two people in the room made it easier to catch things in the moment and collaborate and discuss things on the spot (compared to making the time after class)", and collaboration in the moment was echoed by the grade five teacher who stated that one benefit of being in the same room together was that it gave us the opportunities "to chat about difficulties and find solutions" instantly (Teacher Notes, gr.5).

Prior research has noted that professional collaborations benefit several aspects of teaching and learning such as encouraging teachers to take risks and engage in professional development (Brownlie & King, 2011; Schnellert & Butler, 2014). The teachers in the general classroom and me all took risks when working together. We listened to each other's ideas, problem solved together, and we trusted each other to share the instruction in the classroom based on the needs of the students. Teaching became collaboratively transparent. We challenged each other with extensions of ideas and solutions to situations that we may not have thought about if we were alone in the process. We also maximized each other's strengths, such as when I was given the opportunity to teach the math language lesson. There were also times where we supported each other when things did not work out, such as when the math division worksheet was confusing in the grade 6/7 classroom or in the grade 5 classroom when the students did not have the skills to complete a task and we had to regroup and re-teach skills. From my experience as a classroom teacher, when lessons do not turn out the way

that is expected, it can affect your confidence as a teacher; however, when we are working together we can get through those moments with professional support as equals.

Prior research theorize that professional collaboration benefits several aspects of teaching and learning including creative problem solving, effective co-planning of lessons based on teacher strengths, and creates meaningful relationships in schools (Brownlie & King, 2011; Friend, Cook, Hurley, Chamberlain & Shamberger, 2009; Murawski, 2008; Woodward & Talbert-Johnson, 2009). Beninghof (2012) lists several benefits to co-teaching including building relationships, effective communication, and even the physical arrangements in the classroom. Flexibility became a key component in the effectiveness of the research study because one model was not going to work in all of the classrooms. The teachers and I had to create a vision of how our professional collaboration would work in each classroom based on the needs of the students and the needs of the teacher. It would not have worked for example to use the station model in every classroom. Many researchers such as Beninghof (2012) and Murwaski (2018) can help guide professionals into effective collaborative strategies, but it is ultimately the flexibility of the teachers, who create a shared vision in the classroom, that will provide the most effective collaboration.

In the study reported in this thesis, it was observed that my collaborations with different teachers facilitated curriculum alignment, timely language scaffolding in math, and variations within the learning environment; improved curriculum scope and sequence, and learning continuity; and increased learning environment and timing flexibility. Each of these aspects will be discussed below.

Curriculum alignment. In a Learning Assistant and Resource Room, the LART's role is to provide interventions to struggling learners. The interventions may include a stand-alone program that is different to the one that is being used in the general classroom. One of the main advantages of having interventions delivered to students within the general classroom is that there was a natural opportunity to ensure curriculum alignment. The classroom intervention was based on the content of the curriculum the teachers were teaching in the general classroom. It was not what Allington and Cunningham (2007) refer to as the "other curriculum". I was not teaching a separate program, instead I was scaffolding, pre-teaching, and re-teaching components of the classroom curriculum the students needed in order to be successful in the classroom.

I was also scheduled in the classroom at math time, not a separate time, which reduced the lag time of applying the learned skills. Since I was immersed in the general classroom, I was able to listen to the lectures and observe teaching strategies in the natural classroom environment. I was then able to provide interventions and scaffold student learning based on the resources and concepts the teachers are using in the classroom such as Jump Math, Journeys, Leaps and Bounds, or Math Antics. By understanding "what the classroom teacher is working on" (Final Interview Question.1, Gr.5 Teacher) the "in-class support has the potential to more closely fit the needs of the students-support can be provided that relates directly to the curriculum being covered in the classroom" (Teacher Notes, Gr. 6/7 Teacher).

An example of how an intervention was aligned with the curriculum occurred when the students in the grade 4 intervention group were having difficulty understanding regrouping. I brought base ten rods, cubes, and squares for the students to use in order to

visualize the regrouping of the place value. The grade 4 teacher commented in their teacher notes that "Andrea has brought manipulatives, students seem to like these". I was able to directly align the intervention to meet the needs of the classroom concept being taught that day. The students were able to visualize the process and practice the regrouping skills with hands on materials. After using the manipulatives, students had a choice to use the manipulatives for future practice exercises.

Another example of how I aligned the curriculum to meet the needs of the intervention students was in the grade 6/7 classroom, during a lesson when the students were having difficulty understanding place value. I used a place value chart to supplement their worksheet and directly instructed how to use the chart (Researcher Notes, Lesson 6, Gr. 6/7). I then used the chart to teach the students a game with the chart and modelled how to use the "game chart" as a math aid to complete their worksheet on expanded and standard notation of numbers.

Scope and sequence. When collaborating in the classroom with all of the teachers, we were able to have valuable scope and sequence discussions within the grade, as well as, across the grade levels. Since I was directly involved in the general math classes, I could share what the other teachers were doing in their classroom and provide input on future grade levels. For example, the Place Value Battleship Game that was introduced in the grade 6/7 classroom (Researcher Notes, Lesson 3, Gr. 6/7) was adapted to the grade 4 and grade 5 classrooms, which provided a differentiated scope and sequence across the curriculums. I would often bring resources from other classrooms (activities, observations, lesson plans), my personal library (books, resources, lesson

plans), and suggest ideas that would build from the textbook resources or provide a deeper understanding of the concept being taught.

Understanding, and having experience in all grade levels proved to be a valuable asset to the teachers. The grade 6/7 teacher reflected in their teacher journal, "because Andrea was familiar with high school mathematics, she was able to identify when this concept would resurface and whether we needed to focus on it at this time". In the same classroom the teacher referred to a conversation we had and commented, "we spent some time looking on what I am doing, curriculum wise, and scope and sequence" (Teacher Notes, Gr. 6/7). Together, the teacher and I could discuss scope and sequence goals for the week. The grade 5 teacher and I often had quick discussions regarding weekly goals for the class. "Met with Andrea for discussion of group goals for the week (understanding skip counting and arrays to help with multiplication)" (Teacher Notes, Gr.5).

Another benefit of being present in the classroom also provided opportunities to reflect on lessons right after they were taught. After a lesson in the grade 5 classroom, the teacher and I reflected on whether it made sense to move forward with the next concept and it became an imperative conversation on the importance of going back and relearning a previously taught lesson instead of moving forward. The scope was more important than moving forward in the sequence.

The Learning Assistant and Resource Teacher typically form a relationship with the teacher that is based on the learning needs of students with exceptionalities. From my experience as a LART, teachers may collaborate with the Learning Assistant Teacher or ask for assistance for a particular issue that is presented in the classroom; however, those

conversations are often held in a quick passing in the hallway or in a meeting outside of scheduled class time. Having a LART available within the general classroom is not a general practice, but the qualitative data from this research study illustrates how valuable having a trained professional in the classroom can for both the general teacher and the LART.

Timely scaffolding for math language. Math has content specific language. There are specific words associated with each mathematic operation. For example, in a math story, the word 'altogether' is a signal to the learner that the numerals will be added together or the words 'shared equally' connotes division of numerals. Instead of handing out a math language worksheet, I was able to directly provide math language support at specific classroom curriculum moments. In the grade 4 classroom during Lesson 7, I specifically taught the entire class a math language session. I started the lesson by writing the four operations of addition, subtraction, division, and multiplication on the board. I asked the students to generate some words that they already knew that would tell them which operation to use. One student provided a response that the word 'away' is a word that indicates subtraction. I asked the student for a number story that related to the word 'away' and they responded with "and one bird flew away". I then provided students with additional words and asked the class under which operation heading they should be placed. I used positive corrective feedback for students, reassuring the process of thinking instead of focusing on the correct responses. After the group discussion, I had the students work in small groups with math stories and asked the students to identify the key words (circling, colouring, and underlining) that represented a mathematical operation.

After the class activity, I had the students attempt to solve the math stories individually, while the intervention group then received additional guided instruction of the meaning of the operations. I reviewed each math story with the intervention group and highlighted the key words that they needed to know and wrote the associated operation symbol above the word. Each question we worked through as a group instead of individually, reinforcing the learning target taught to the entire class.

The same math language lesson was introduced to the grade 6/7 class to the intervention group to frontload their learning while watching a math video called "Flatland". The movie teaches students about properties of shapes and since the characters are part of an alternative universe that is all about math, they use math language. The visual and the spoken word reinforce the concepts of the math language the students were being exposed to in the movie. The grade 6/7 teacher and I briefly discussed the class activity associated with the movie, which was to generate as many math terms as the students could, as they heard the terms in the movie. I frontloaded the intervention group on math language terms before the movie, so they were aware of words that were associated with each operation and we generated some additional words that could be used such as "angle" or shape words like "quadrilateral" or "sphere". By front loading the struggling learners, they were able to be successful with the whole class activity.

The two math language lessons were adapted to meet the student and the classroom teacher's needs; however, the importance of the lessons is that I was used as a bridge to connect the math language learning between the two classes. The math language lessons provided a common language between the grades and allowed the

introduction of the language at the appropriate moments in the classroom. The grade 5 teacher commented on the importance of all of the educators using the same math language because the language could be "used in 2 different buildings" (Teacher Notes, Gr.5). The research study took place in a rural community where the grades 4-7 classes are separated between two buildings. The teacher's reflection is based on the opportunity to have the continuity of a common math language being used at the two school locations.

Flexibility of the learning environment. The traditional pull-out model involves students being assigned a block of time with the Learning Assistant and Resource Teacher in a separate learning center. The blocks of time are determined by the LART, the teachers, and the number of students. Precise times may vary and there is not a standard intervention time. From my experience as a Learning Assistance teacher, blocks of time are usually around 20-30 minutes. In a pull-out model, the LART creates a schedule and the students are pulled out to attend lessons at the learning center. In the push-in model of intervention, I created a schedule that corresponded the needs and timing of the general classrooms (see Figure 2). Since I work within the classroom, flexibility of the learning environment and timing of the lessons could take many forms depending on the needs of the classroom and the learners. The intervention time with the struggling learners were 20 minutes in length and I spent the remainder of the block of time assisting all learners in the classroom. Each classroom had a 45-minute block twice a week allocated to LART scheduled time. The high school schedule varied in scheduled time due to the unique block rotations and my availability.

Figure 2 LART Schedule

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Elementary School					
8:00 - 8:45	emails/meeting	emails/meetings	emails/meetings	emails/meetings	emails/meetings
8:50 - 9:30	Grade 3	Kindergarten	Grade 3	Grade 1/2	Grade 1/2
9:30 - 10:15	Grade 2	Grade 4	Grade 2	Grade 4	Kindergarten
10:15 - 10:30	Recess	Recess	Recess	Recess	Recess
High School					
10:44 - 11:09	Grage 5/6	Grade 5/6	Grade 5/6	Grade 5/6	Grade 5/6
11:10 - 11:26	Break	Break	Break	Break	Break
11:27 - 11:44	Student Check-in	Student Check-in	Student Check-in	Student Check-in	Student Check-in
11:45 - 12:30	Grade 6/7	Grade 5	Grade 6/7	Grade 5	Intermediate Block
12:31 - 12:43	Student Check-in	Student Check-in	Student Check-in	Student Check-in	Student Check-in
12:43 - 1:38	Lunch	Lunch	Lunch	Lunch	Lunch
1:38 - 2:55	Block Rotations	Block Rotations	Block Rotations	Block Rotations	Block Rotations

Below are the two examples of flexible learning options that the push-in model afforded: physical classroom arrangement and timing.

Variation within the learning environment. A unique quality of the push-in model is that it provides an opportunity to have variations within the learning environment that is not typical in a pull-out model. In a pull-out model, student learning is typically confined to the LART designated room and includes individual or small groups of learners. There may be instructional variation by the LART but the LART in a pull-out model does not collaborate with the classroom teacher on how to physically arrange students or decide on pacing that corresponds with the rest of the class.

In a push-in model, the teacher and the LART collaborate on all aspects of the learning environment including the physical arrangement, pacing, and whole class transition integration. In the research study each classroom had variance in how the push-in model would be delivered and there was flexibility within the environment based on the needs of the students, teacher preferences, or driven by the learning targets of the

lesson. For example, was it more beneficial for the students to receive the intervention at the beginning or end of the lesson? Do the students in the intervention group need access to materials in another part of the classroom? These questions would be answered collaboratively between the teacher and the LART. The following examples of variations and flexibility within the learning environment illustrate how each classroom was adapted to the needs of the learners.

In the grade 5 classroom, the teacher and I decided that what would work best for our collaboration was to work with the students in a station model since we agreed collaboratively that the students would learn through a series of group rotation. The classroom was arranged in warm up groups and math groups that rotated every 15-20 minutes. The warm up group was called "Brain Booster" groups, which allowed a natural grouping for a math intervention group within the classroom. There was not a designated area where I worked with the intervention group, instead I moved to a location that maximized student learning. Often, I would locate to where the students were located instead of have the students come to where I was located within the classroom.

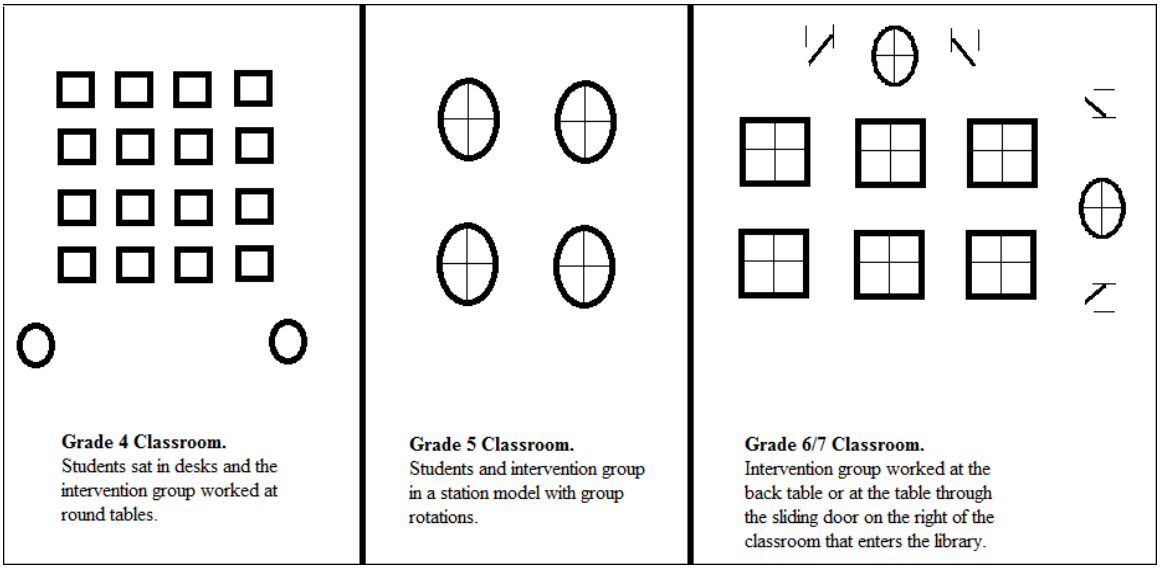
The intervention group was part of the warm up group and was set to a timer of 20 minutes. During the intervention group I would re-teach or frontload the students on concepts that needed additional support. In one lesson, I focused on reviewing strategies for multiplication such as how to use a multiplication chart and patterns within the multiplication chart. The teacher and I had previously discussed that the students could use the multiplication chart as a tool for learning but she was not confident that the struggling learners knew how to use a multiplication chart properly and she did not feel the whole class needed the lesson on multiplication chart use. Teaching the students how

to use the multiplication chart was a warm up activity that taught a specific skill that could be used right away in their group work activities.

In contrast to the grade 5 classroom rotations, in the grade 6/7 classroom, I worked with the intervention group in either the backroom of the classroom or just outside the classroom in the library. We opened the glass doors and extended the classroom so the intervention group was within the classroom perimeter. The high chairs and the high desk in the library was an already established place of privilege to work and created a positive space for the intervention group to work.

The grade 4 classroom is located in the elementary building, which is separate from the high school building. The grade 4 classroom has a back table that is often used by adults to support learning. Using the back table for the intervention group within the classroom was a natural fit for everyone in the classroom. Flexibility of the physical arrangement of where the interventions took place also became flexible. For example, during lesson 9 in the grade 4 classroom, the teacher wanted the students to work at their desks. I worked with the intervention group at their desks individually in order to differentiate learning and it went surprisingly well (Researcher Notes, Gr.4). I was able to adapt to the needs of the classroom teacher yet still provide meaningful support for the students, which illustrated how flexibility of the physical arrangement in the classroom can be effective (see Figure 3).

Figure 3 Physical Arrangements of the Classrooms



Each teacher designated purposeful spaces for learning within the classrooms and we collaborated as professionals on how the intervention groups would become included in the classroom in a positive, meaningful way. Within each classroom, individual teaching styles differed which affected the arrangements of the intervention group. The grade 5 teacher liked the small group rotations whereas the grade 4 teacher preferred a designated area to support learning. In a pull-out model, students will work one to one with learners or in small groups and professional collaboration is not part of the physical arrangement of the LART room.

Flexibility of timing. In response to the question of "what is one of the main benefits of having the LART in the classroom?" the grade 4 teacher stated, "flexible schedules: if time needs to be rearranged there is flexibility between the teacher and the LART" (Teacher Final Interview Quest.1, Gr.4). If there is an interruption to a pull-out schedule, students and the LART will often lose their time together. There were times

throughout the research project where interruptions resulted in time needing to be re-arranged. In the push-in model we could quickly adjust our schedule or discuss re-arranging an alternate time. For example, in the grade 4 classroom during one of our lessons, the teacher had to deal with an unexpected situation. In response, we flipped the lesson where I taught the whole class first (allowing the teacher the time they needed) and once the teacher returned, I took the intervention group (Researcher Notes, Lesson 7, Gr.4).

Continuity of learning. A common situation in the classroom environment is teacher absences. A Teacher Teaching On Call (TTOC) is scheduled to teach the class when the classroom teacher is absent. In a pull-out program the absence of a teacher does not affect the intervention since lessons are taught separately, unlike the push-in model where the absence of a teacher can affect the learning environment since the intervention is taught within the classroom.

In all three classrooms there were instances of teacher absences; however, having the LART present in the room created a continuity of learning for students. The grade 6/7 teacher reflected that "thankfully, because Andrea was assisting and supporting students while I was away, she was able to identify that there was a problem, and we were able to discuss and analyze what the problem was and to back up and change direction" (Teacher Notes, Gr.6/7). When the teacher was absent, I had the unique opportunity to tell the TOC about the routines and expectations of the class and the TOCs thanked me for the support (Researcher Notes, Lesson 12, Gr.5; Researcher Notes, Lesson 8, Gr.6/7). As the research study progressed throughout the twelve weeks, so did my relationships with the teachers.

Relationships with teachers. One of the most critical elements of the success of the research study is the relationships that developed between the teachers and myself. I had never met the teachers before arriving to the schools. One teacher had a few years of experience, one teacher is a relatively new teacher, and one teacher is a seasoned teacher of over a decade. Every teacher had experience working with Learning Assistant Resource Teachers but no one had ever had a Learning Assistance Resource Teacher become part of their classroom. Although we all knew our professional roles and responsibilities, how the relationships would evolve, grow, or even potentially become damaged were risks that all of us were willing to take in order to examine a new model for student learning.

In this research study, three subthemes regarding the relationships between the teachers emerged: professional vulnerability, professional identities, and extended relationships. Each subtheme of the relationships with teachers is discussed below.

Professional vulnerability. One of the most unexpected feelings that I had starting the research study was professional vulnerability. I felt that I had to be the best teacher I could be, so that I could earn the honour of working in their classrooms. There was a sense that I was entering their territory, and yet I had a territory of my own to maintain as a Learning Assistant Resource Teacher. With physical classroom boundaries being meshed together there was uneasiness. In a separate room, in my learning center, I felt confident with my routines in place, and I knew my plans. I felt effective. Now, I was entering another person's classroom bringing in my resources, adapting to their environment. I now felt exposed. What I did not anticipate was that the teachers also felt the same way.

When reflecting on the idea of another professional working with them in their classroom, the grade 6/7 teacher stated:

> I recognize that it will require me to be vulnerable-willing to have a colleague observe what I was doing, and to be willing to receive feedback and accept suggestions to do things differently - and to hear that something I'm doing could be done differently - or better. This can be a little unnerving! (Teacher Notes, Gr. 6/7).

The grade 4 teacher similarly stated that when another professional is working in the same room you feel 'vulnerable as a teacher'. Along the same lines, the grade 6/7 teacher remarked that they were "willing to do what's best for the students, even if it makes me uncomfortable as an educator" (Teacher Notes, Grade 6/7). Even though we all felt the vulnerability, there was a common goal, which made the relationships we were establishing worth building.

Schnellert and Butler (2014) mention the idea of a "culture of trust" when referring to professionals being valued and their strengths honored in a collaborative relationship. Trust was an essential component in the relationships with the teachers, and I felt an overwhelming sense that I had to earn the respect and trust of the teachers to allow me into their classrooms. We established trust over time through effective communication and getting to know each other; but there was a deeper feeling than just trust. I felt that I could trust the teachers and that trust was reciprocal; however, it was not trust that seemed to chisel at my self-confidence, it was professional vulnerability.

Professional identities. When I first started entering the classroom, professionally, we had to redefine our identities. I was not an educational assistant that would support learners, I was a teacher, and I have additional training that includes being efficient in delivering intervention programs that are academic and social/emotional based. I knew I wanted to be a co-teacher in the classroom, but there was a fear that I would not be seen as a co-teacher. Slowly, those fears extinguished as the professional relationships grew and our professional identities were established. In the first lessons, my role was more of one as an educational assistant but quickly it grew as a valued teacher within the classroom.

What facilitated the change in relationships was establishing a deeper relationship of professional parity. It is difficult to pin point the exact moment when our professional relationship changed, but with each teacher, we grew to maximize the potential of having two professionals in the room. There was an understanding that we were part of a process of learning for the students and for each other. The grade 6/7 teacher summarized our experiences together stating that "we weren't experts over each other, we were equals" (Teacher Final Interview, Quest.3, Gr.6/7).

Once we established our professional identities as trained professionals, there were specific lessons that were clear turning points of when I felt the teachers in the classrooms and I became co-teachers. The grade 4 teacher and I were planning lesson 7 together, and I was asked to teach the math language lesson. I felt validated as a professional and respected that she saw me as co-teacher (Researcher Notes, Lesson 7, Gr.4). In the grade 4 classroom, one student said that the teacher and I "look like really good friends" (Researcher Notes, March 27, Gr.4). The statement from the student made

me truly reflect on the identity and relationship the grade 4 teacher and I were developing, and the impact it had on the students. We were not two people 'forced' to work together, instead we wanted to work together for their benefit. Professionally, that statement from the student made me realize that the professional relationship between the teacher and I had significantly changed, and that change was noticed by the class. The relationship with the grade 4 teacher was highlighted once again at the end of the research study. On one of the last lessons in the research study, the teacher sent me a video of two students reading. The teacher chose me to share the good news with because it was an important moment in the classroom and although it was not our designated time together, we both celebrated as co-teachers.

In the grade 5 classroom, it was during lesson 4 where I felt there was a pivotal moment in our professional relationship. During a brief conversation, the teacher turned to me and said "I like working with you" (Researcher Notes, Lesson 4, Gr.5). It was a very simple statement, but it was a genuine statement on the importance of our professional and personal relationship. It was at that moment that our relationship shifted from teachers sharing the same place, to co-teachers that built a genuine relationship. As our relationship continued to grow, the grade 5 teacher trusted me to make adaptions to lessons, and I was even included in professional development planning for the classroom; this never would have happened if we taught in separate classrooms (Researcher Notes, Dec.3).

One of the most powerful co-teaching moments of the research study was during a math lesson in the grade 6/7 classroom. I started the lesson with the intervention group; it was a lesson on investigating division. The purpose of the lesson was to understand

division of zero and to identify what number needs to be placed in the divisor and what number is placed in the dividend. As I was scaffolding their learning, one student voiced their opinion that they did not understand how 0 could not be divided by 5. Their logic was that if there was nothing (0), and there were 5 people, then it makes sense that the 5 people received 0 because there was 0 to begin with. Another student in the group said that if you have 5 and you share with 0 people, then you still have 5! Both answers were completely logical; however, their answers did not correspond with the answers on the worksheet. It was in that moment that I understood where the students had difficulties understanding the purpose of the worksheet lesson, and I immediately went to the teacher. Instead of just dismissing the question as unclear, we took the opportunity to illustrate to the class our learning. We gathered the students and took turns explaining how we saw the relationship of division (Researcher Notes, Lesson 10. Gr.6/7). We asked the class to explain 5 divided by 0 vs 0 divided by 5 and the teacher and I both stated our understanding of division. It was an excellent debate on the concept of division. Having both of us explain our thinking and the thinking of the other students created a rich dialogue. "Andrea was able to jump in and use their conversation as a discussion point to further their learning. This is the beauty of in class support!" (Teacher Notes, Gr. 6/7). After the lesson, the discussion did not end for both of us. We spent our lunch hour discussing different approaches to scaffold learning and how differently students and ourselves as professionals viewed the concept of division, which "generated an interesting philosophical discussion" (Teacher Notes, Gr. 6/7). The teacher further reflected on the importance of the lesson in their journal as it related to the teacher's confidence and the value of having a co-teacher:

> These past few days -and lessons- have been incredibly enlightening -and exciting! I can confidently say that in the past, it would have been enough to unnerve me and shake my confidence as an educator-but being able to collaborate, come up with new strategies, try again and experience success and new insights has made less-than-ideal lesson days some of the most powerful learning and teaching lessons for us! (Teacher Notes, Gr. 6/7).

During this lesson, I was able to use the voice of the students in the intervention group to illustrate learning that extended into a true co-teaching moment. I felt confident I could share my ideas, and the teacher allowed us to learn together with the class.

Extended relationships. Building relationships with colleagues within the classrooms, created a ripple effect within the school and across the school district. We were fortunate to have a member from our school district math department come to our school to coach the students and teachers for a math lesson. I had the opportunity to interact and be part of the class and see how the coordinator taught the lesson. If I had not been in the class, I do not feel I would have had the chance to work with the math coordinator (Researcher Notes, Lesson 5, Gr.4). Several events throughout the research study extended my professional relationships with other colleagues.

Because the push-in model was so successful in the math classrooms, I used the model for both the elementary and the secondary schools. It was in a high school class where I was fortunate enough to have one of the most valuable experiences I have had as a teacher. As an LART, I am responsible for the case management of students with exceptional learning needs. One of the students on my caseload heard the announcement one day that the district would allow grade 8 students to attend the *Model United Nations*

Conference. There was only one grade 8 student that showed up to the meeting. The student's smile could be seen across the hall, as they wanted to be part of the *World Health Organization Committee* because they were a self-proclaimed expert on viruses. The student's mother phoned me all excited about the opportunity, but shortly after the parent's phone call, I saw the teacher sponsor in the hallway, and they looked very concerned. With the student's complex needs, there was no way that they would be able to support the student and look after the other candidates. The student could not go without support. The student's parents were working, and it seemed like the student's dream would be crushed unless another teacher went. The sponsor teacher and I decided that it would be an excellent opportunity for me to go with them.

I truly believe that without welcoming colleagues into a professional relationship and by being seen as a partner in the school, a co-teacher, it would not have been an option for me to attend. I spent three days co-supervising with the sponsor teacher and witnessed the most incredible growth from the student because of this opportunity. The sponsor teacher and I had many concerns about the trip including whether he could attend all of the sessions. We developed plans to make sure that the student had options if things did not quite work out as we had planned. I have never actually seen this student focus and attend a lecture type session for more than twenty minutes, and surprisingly to everyone, he was able to sit through multiple sessions and twelve-hour days. One of the student's personal educational goals was to remain on topic at school. At the Model United Nations, he not only prepared a speech on a specific topic, but he was one of the first students who spoke in front of a large audience. With a perfectly fitted blazer, the student was "in his element" and thrived (see Figure 4). Being visible in the school,

communicating, building relationships with colleagues extended outside of the math classrooms and resulted in a student having one of the best experiences of his education.

Figure 4 Student at the Model United Nations Conference

The extended relationships that developed between colleagues during this research study were critical in the success of the research project, and another unexpected and important theme emerged. I was provided with several opportunities in the general classrooms to not only authentically observe all students but also develop relationships with all students in the schools.

Inclusive access to all. Just as the relationships started to extend to colleagues outside of the math classrooms, the relationships I developed in the intervention groups extended to the rest of the class. After the intervention group and I had our time, I remained in the classroom to assist the teacher/students. It is important to mention that although I did not work specifically on Growth Mindset strategies for the general

classroom learners but because I use a Growth Mindset approach to teaching (positive language use, multiple ways and modes and learning, math talks, and thinking strategies) the general learners were exposed to a Growth Mindset approach because that is the instructional approach I use as a teacher.

The time spent in the classroom also provided a unique professional observational opportunity because of the push-in model. Observation time by the LART is often scheduled but during a push-in model, I had the opportunity to observe all students in their "natural" classroom environment frequently. My presence in the classrooms was not questioned, which only added to the authenticity of observations. Opportunities to observe the entire class proved to be most valuable for Inclusive Educational Planning (IEP) meetings.

When discussing the classroom environment at IEP meetings, I could comment on the learning in the classroom because I was witnessing how students were learning and interacting. I also had a rich context to ground the IEP goals for students or other students who require a school base meeting (Researcher Notes March). I could ask teachers questions about particular students that may not have ever caught my attention before and likewise, the teachers could make comments about student learning immediately instead of scheduling a meeting. I felt as though I could provide another lens to the classroom learning environment that benefited not only struggling learners, but all learners.

In this research study, it was also observed that the professional collaborations established with the teachers in the general classrooms provided opportunities to have inclusive access to all students. Since the research study took place in the general

classrooms the subthemes of relationships with all students and stigma of help also emerged and will be discussed further below.

Relationships with all students. Teachers have commented on the importance of the LART working with all students as it allows more Universal Design opportunities, and the fact that the LART "can catch struggling learners before they fall" (Teacher Notes, Gr.5; Teacher Final Interview, Quest.1, Gr.4). "The LART knows the class as a whole (friendship dynamics, interactions, can see other struggling learners)" (Teacher Final Interview, Quest.1, Gr.5). One teacher reflected that my presence in the classroom "seems to be somewhat easy, natural" (Teacher Notes, Gr.4). Following a lesson with the intervention group, we asked if anyone else would like to participate with what we were learning. The students responded so positively that we tried it again and when asked to join my group "many hands go up-THIS is the kind of thing we WANT to see!" (Teacher Notes, Gr.6/7). The grade 6/7 teacher further explained that:

> Andrea knows all of my students, not just a small group that joins her elsewhere. My students know her too. Now, it is nothing unusual for her to be in the classroom, circulating, chatting, discussing ideas and strategies and brainstorming with me-and we 'tag team' those strategies and ideas as class discussions occur (Teacher Notes, Gr.6/7).

There seemed to be a fluidity of assistance in the classrooms and all students were willing to learn.

Reducing stigma. During the first lesson together in the grade 5 classroom, we decided to have the intervention group located just outside the glass sliding door that lead to the library. The idea was to extend the classroom. The teacher and I had no idea how traumatic relocating the students in the intervention group to just outside the door would be for them. The students did not want to go to the table. Some shut down completely, and there were tears (Researcher Notes, Lesson 1, Gr.5; Teacher Notes, Gr.5). The reaction of the students who were just inches from the classroom symbolized how a push-in intervention can destigmatize working with a Learning Assistance and Resource Teacher. "Students know if they are good at something or not-as much as we think they don't know they do and a pull out would signal to them there is something wrong with them" (Final Interview, Quest. 3, Gr.5). The students did not want to be taught outside the classroom and internalized the relocation.

The issue of stigmatization resurfaced in the grade 6/7 classroom. One student that we decided to place in the intervention group did not want to work with me. I also happen to be the case manager for that student's older sibling who needs considerable support. The grade 6 student associated working with me as a sign that they also needed considerable support. The student wondered what was wrong with them to warrant my support (Researcher Notes, Session 3, Gr.6/7). I explained that working with me was voluntary, and soon that same student who was reluctant to work with me said in a future lesson that "I do better with a little bit [of time] from you" (Researcher Notes, Lesson 12, Gr. 6/7). The student chose to seek help from me instead of feeling like they HAD to go to me for help because something was 'wrong' with them. The stigma of receiving

support from the LART was lifted and she became confident in asking for help from another ‘teacher’ in the classroom.

The final theme of the qualitative research from the research study in this thesis is Growth Mindset. The instructional approach of Growth Mindset was previously discussed in the quantitative research; however, the student math reflection sheets and observations from the teachers provide further insight into how Growth Mindset also gained importance as a qualitative component of the research study.

Growth mindset. I wanted to examine during the research study if the push-in model had an impact on the Growth Mindset of the students. When I started the research study students in the intervention groups presented with a fixed mindset; believing that their ability in math could not be changed. When asked to complete a self-reflection, which asked the students for their strengths in math, one student did not complete the initial one. The student stated that they were not good at anything in math and submitted a blank paper. Students in general were not confident and felt as though they were just not good at math.

As the lessons continued with the intervention group, the teachers perceived that there was a change in the mindsets of the students. “The quality of work has improved” and “there was a change in confidence. The students were excited to start math and looked forward to Tuesdays and Thursdays when the LART came to the room” (Teacher Final Interview, Quest. 4, Gr.5). In the grade 5 classroom the teacher reported that the students in “the LART group in particular are communicating ideas and using more math language” and a common phrase in the classroom is “I’m a mathematician” (Teacher Final Interview, Quest.4, Gr.5). In the grade 4 classroom, one student “showed more

Growth Mindset by not shutting down as much" (Teacher Final Interview, Quest. 5, Gr.4). Similarly, a student in the grade 6/7 class was able to complete their self-reflection sheet at the end of the research study, which was an unobtainable task at the beginning of it (Researcher Notes, Gr. 6/7).

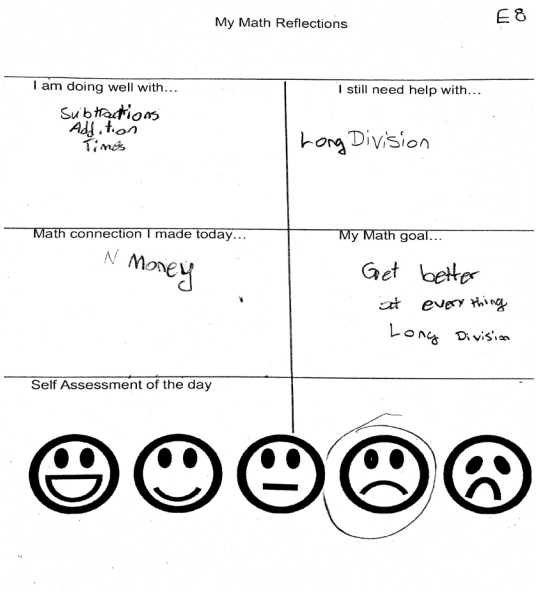
At the end of the twelve lessons, it was exciting to witness the changes in the student's Growth Mindset. When I asked how one student felt about their math, they responded with "good, I'm faster now, I got this" (Researcher Notes, Lesson 3, Gr.4). A student who would break down crying when they got a question wrong came running up to me in the hallway and said "Mrs. Mackenzie, I'm learning my 2 times with flashcards. I'm learning math facts!" (Researcher Notes, Feb. 22, Gr.4). One of my most heartwarming moments was when one of the students from my intervention asked to leave the group because they felt confident and did not need my support (Researcher Notes, Lesson 11, Gr.4). This same student did not feel they were good at math at the beginning of the study and now "has shown an increase in confidence" to a point where they could work through strategies on their own (Teacher Notes, Gr.4). The purpose of the math reflections was to provide an opportunity for the students to reflect on their learning and provide a platform for their voice. Within the reflections, Growth Mindset data can be examined qualitatively through the words students used to describe goals and general positive and negative emotions referring to mathematics.

When the student growth and improvement was examined, there were trends that supported growth and improvement (see Appendix K for student responses). At the end of the research study when the second reflection sheet was given to the students to complete, all students completed the sheet. Generally, there were more details provided

by students in the second response sheet, which included the students explaining mathematical thinking and diagrams. There was also an increase in positive statements with a reduction of "I don't know" or "nothing" responses that would be considered negative Growth Mindset responses. The responses in the second reflection journal by participants in my research illustrates a shift from what is typically observed in students' attitudes towards math (e.g., that it is about getting the answers right, Boaler, 2016) suggesting that my intentional efforts to foster Growth Mindset in mathematics throughout the intervention period were effective.

In the grade 6/7 class, one student did not submit their beginning math reflection sheet. The student turned their paper over, and put their head down on their desk and did not complete the assessment. The same student did complete the math reflection sheet at the end of the research study. Although their answers were not elaborate, the fact that they were able to complete the second reflection sheet demonstrates an increase in the students' Growth Mindset (see Figure 5).

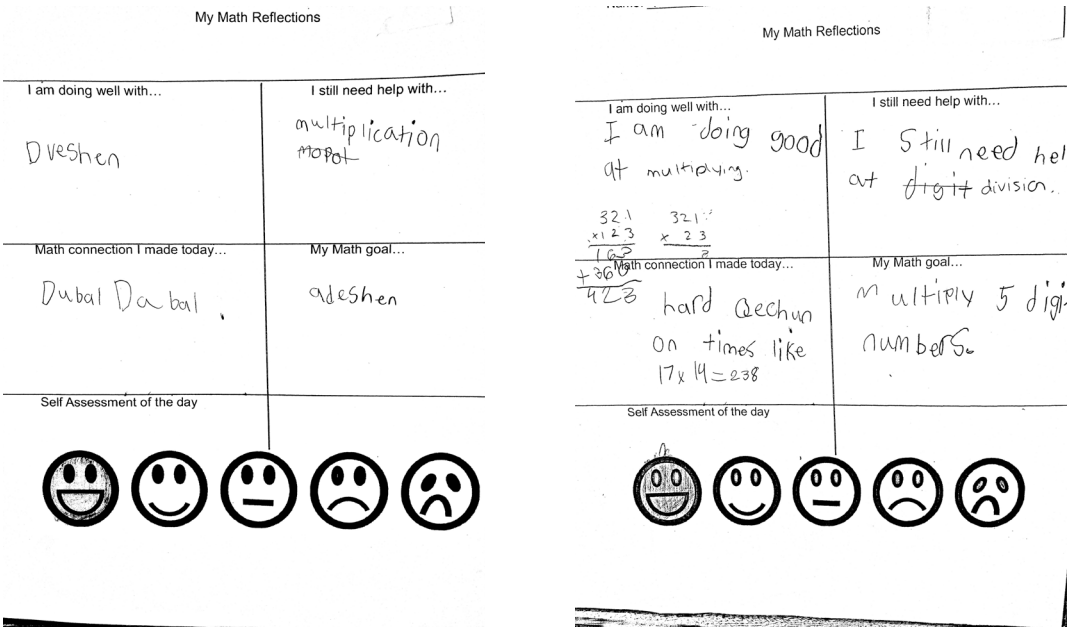
Figure 5 Student Reflections on their Math Ability and Learning: Sample 1



The student made a math connection with a mathematical concept, which was money and they listed three curricular topics with which they feel they are doing well. The student states what they need help with and set a goal of "long division". The "get better at everything" statement is an example of a fixed mindset statement; however, the identification that long division is the topic that is causing difficulties for the student signals an improvement in Growth Mindset.

When identifying growth from students and assessing mathematical mindset, the explanation of mathematical concepts and evidence of visual solutions are factors to consider (Boaler, 2016). In the grade 5 classroom a student illustrated growth in mathematical mindset by providing complete answers in the second math reflection sheet, as well as, illustrations and specific information regarding goal setting such as "multiplying 5 digit numbers" (see Figure 6).

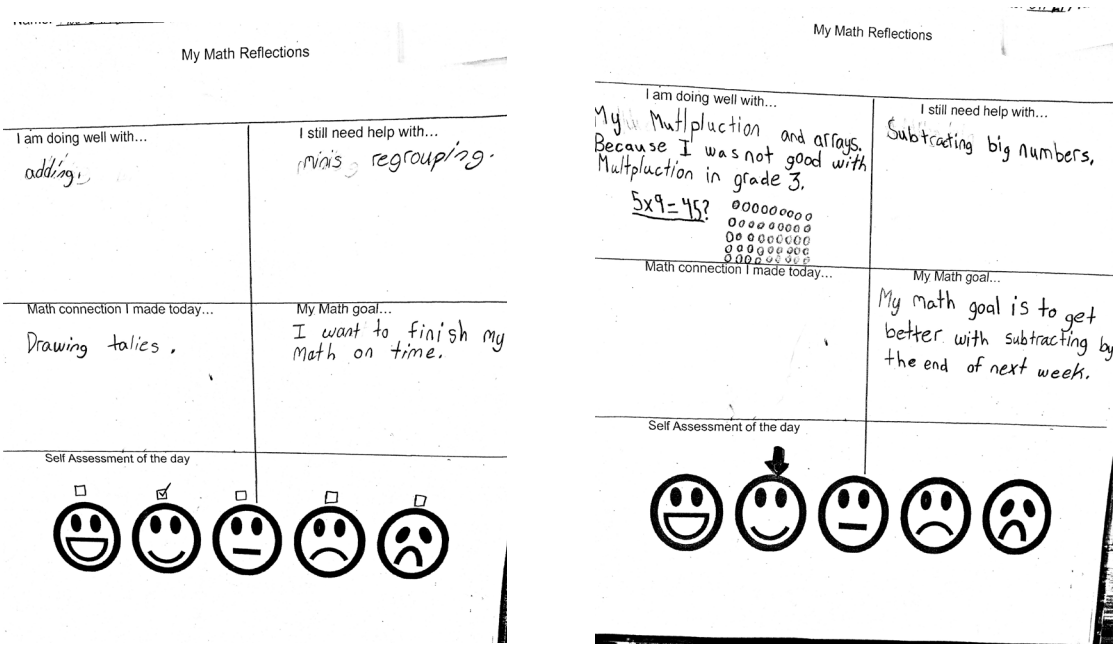
Figure 6 Student Reflections on their Math Ability and Learning: Sample 2



The student had only one-word responses for the first math reflection, but illustrates greater detail in their responses in the second math reflection. The phrases the students used are positive and the student provided examples of what they are doing well. As a teacher, I have a clearer idea from the second assessment of what the student needs helps with and what they have learned instead of vague math language.

One of the most important aspects of number sense and Growth Mindset in mathematics is being able to see the "openness of numbers", and to be able to share different methods of how to solve a mathematical equation, instead of feeling that there is only one correct way to solve a math problem (Boaler, 2016). The following example of a student's math reflection illustrated how a student used different strategies to illustrate their learning (see Figure 7).

Figure 7 Student Reflections on their Math Ability and Learning: Sample 3



The second math reflection uses an array model by the student to show the student's thinking and method of solving 5 x 9 = 45. Instead of using just the word 'multiplication' the student used the word "array" which demonstrates an understanding of math language and the conceptual knowedge of the meaning of mutiplication as it relates to repeated addition in the form of arrays. Although the student did not think of a math connection, the overall presentation of her mathematical thinking in the second reflection indicates an improvement in Growth Mindset.

Discussion

The purpose of the research study was to determine the effectiveness of providing mathematical interventions for struggling learners within the classroom setting (push-in model), to examine Growth Mindset changes in the students, as well as, investigate the experiences of the classroom teacher, LART, and students, using a collaborative teaching model. The quantitative and qualitative research were discussed and organized by the following research questions: 1) Are there significant changes in Growth Mindset for the children participating in the push-in intervention? 2) Are there significant differences in Growth Mindset between children struggling in mathematics compared to their peers? The qualitative component aimed at answering the following question: What are the experiences of the teachers and students in a push-in model of intervention for students struggling in mathematics?

One of the strengths of this study is that it combines both qualitative and quantitative data to capture Growth Mindset in mathematics in a group of struggling learners. Another strength of this study is that it provides a thorough examination of a model of professional collaboration between a LART and the general classroom teacher through a push-in, co-teaching model. The Participatory Action Research design was essential for successful collaboration. The action plan and inquiry was motivated by the need to use an alternative teaching model to provide student services that reflected a more inclusion approach to numeracy instruction.

The main topics of discussion for this section of the research paper are presented in the following order: Growth Mindset changes of students in the push-in model, experiences of the push-in model, teacher autonomy, inclusion implications, and the

implications for teachers, applications to Universal Design for Learning and Response to Intervention, and the implications for teacher education. Finally, I will present direction for future research and vision.

Growth Mindset Changes of Students in the Push-In Model

Growth Mindset is a trending concept in all subject areas and has been recently applied to mathematics; however, measures to determine Growth Mindset are limited, most notably in Canada. The main researcher of Mathematics in Canada that addresses the issue of mathematics and the myth of ability (some can do math, some cannot) is John Mighton (2007). Dweck, and Mighton both address the importance of pursuing a change in self-perception related to mathematics; however, measures are often anecdotal or formative, based on an increase of grade scores. One popular measure that is used by classroom teachers is the Growth Mindset Questionnaire (Boucher, 2016). The questionnaire was used in the research twice (once at the beginning of the study and again at the end of the study) to establish if there was significance in Growth Mindset gains for students who were in the intervention group compared to the rest of the class. The data indicated that the students in the intervention reported a 9% increase in Growth Mindset (see Table 1). The 9% growth in a 12-lesson period is important in terms of evaluating if a teaching program, method, or approach is valuable for the learners. I was very pleased to see an increase in Growth Mindset; however, there were some limitations to the research.

One of the main limitations to the Growth Mindset Questionnaire as a quantitative research method is the validity of the measure. The Growth Mindset Questionnaire, although highly popular and presented as part of professional development for teachers,

did not have data regarding validity and reliability. The reliability of the questionnaire obtained with the sample in this study was moderate. A stronger reliability for a measure will produce more accurate data, affording more valid conclusions; however, an alternative measure was not found at the time of the research study. Future research should include establishing a measure that has a higher reliability and validity than the Growth Mindset Questionnaire used in this study. If the measures being used in the research have a high validity then there is confidence in the results of the research (Briggs & Coleman, 2007). In regards to this research study, the Growth Mindset Survey questionnaire did not result in a high validity which then questions whether the measure of the survey used accurately represented the Growth Mindset of the learners in the general mathematics classroom exposed to the push-in model. It is possible that stronger reliability of the instrument used to measure Growth Mindset would have yielded stronger statistical results. Having said this, when combining all sources of data on Growth Mindset, including qualitative data from the student math journals, and the interview questions, there is evidence to support that the central phenomenon of Growth Mindset was observed in students participating in the intervention. Thus, data triangulation increases the trustworthiness of this study. The robust qualitative data provides credibility of the observations made on students changes in Growth Mindset.

The research project did use many of the strategies that relate to encouraging instruction of a positive Growth Mindset, but I did not use all of Dweck's instructional strategies in the research study. Dweck's (2016) work also includes video modelling which was not a method used in this research study due to the limitation of time designated to each classroom. I have used video modelling as a LART for behaviour

intervention, and it would be valuable to examine, in the future, the effectiveness of video modelling in relation to Growth Mindset.

Another component that should be considered in additional research is to examine the academic achievement of the intervention group specifically related to mathematics. There was an attempt by the researcher to determine academic growth of the students in the intervention group; however, a valid measure that would capture learning growth across the multiple ages included in the study was not found. The qualitative data; however, did present some encouraging insights. The student reflections and teacher interviews suggest that there were changes in student understanding of math.

Many of the limitations of the study echoes previous research studies that imply that the empirical research of Growth Mindset is limited due to many factors that affect attitudes and beliefs such as attendance, poverty, and appropriate measures available to accurately and quantitatively study Growth Mindset, as well as, sustained teaching practices (DeBacker, Heddy, Kershen, Crowson, Looney & Goldman, 2018). In this study, I was able to model a Growth Mindset approach to the learners in the classroom; however, I could not control how much or how little the approach continued when I left the classroom.

Since quantitative measures were difficult to find for this research study, the project relied on the experiences of the researcher, teachers, and students in order for all participants in the study to have a voice in describing their experiences of having the LART in the general mathematics classroom collaborating with the general teacher.

Experiences of the push-in model. The qualitative component of the research study clearly represents the experiences of the teachers, LART, and the students through journals, interviews, and math reflections. The experiences of the teachers and the students were highlighted in the findings in regards to their participation in a push-in model of intervention aimed at students struggling in mathematics. As the qualitative data was analyzed, themes emerged such as relationship building, curricular alignment, and reducing the stigma of struggling learners. These themes align well with the literature regarding the positive influence of the push-in model in the general classroom (Arlington & Cunningham, 2007; Bean et al., 1991; Barton, 2016; Fernandez &Hines, 2016; Woodward &Talbert-Johnson, 2009).

The most significant finding from this study about the influence of the push-in model was the strength in the relationships that developed between the LART and the classroom teacher, as well as, the relationships established with the students. Horn, Kane, and Garner (2018) discuss the growing evidence that directly relates to teacher collaboration and student achievement. They note that there is evidence that student achievement increases because of two teachers working collaboratively in one classroom (Horn, Kane & Garner, 2018). Although mathematical/overall achievement was not a component of this research study, there could be a connection made from the data of this research study that when teachers were involved in a collaborative process with the LART, there could potentially be an increase in the academic achievement of learners. Future research should examine the effect of a collaborative, push-in, learning support model on student achievement in math.

The relationships among teachers and students in this research study had pivotal moments where a teacher accepted the LART as a co-teacher, such as, when the LART was asked to lead a lesson on Math Language (Researcher Notes, Lesson 7, Gr.4). The relationships with the students became a genuine teacher/student relationship instead of the LART having the reputation of only being someone you go to if you are a struggling learner.

One of the most surprising themes that emerged from the research study was professional vulnerability. At the beginning of the study, all of the participants, including myself, felt "uneasy", or "vulnerable" sharing a classroom. In the school district where the research was conducted, it is common for teachers to share a classroom in their practicum placement, or when they mentor a student teacher, but it is uncommon to consistently professionally collaborate and witness firsthand each other's teaching. Having two professionals in the same classroom co-teaching lessons is not a common experience in our school district. Once the barriers were broken and trust established the professional collaboration became "natural, easy" parity. Although the professional vulnerability became a highlighted experience of the research study, professional vulnerability could also be a limitation to the model depending on individual personalities.

Teacher autonomy. I was very fortunate to have co-workers that welcomed my presence in the classroom, which enabled me to use effectively a push-in model of intervention. If teachers do not believe in the push-in model, or do not want to engage in professional collaboration, the push-in model could not be pursued due to professional autonomy. The British Columbia Teacher's Federation (BCTF), the union that represents

teachers in British Columbia, Canada, has a clearly written statement, which clarifies that teachers have the professional rights and autonomy (see Appendix J). Depending on the beliefs and interpretation of the push-in model, a teacher could feel that the push-in model violates professional autonomy within the general classroom. This is a critical factor in the acceptance and effectiveness of the push-in model that I feel needs to be addressed by teachers. Co-teaching success therefore may not be only dependent on the support of administration but dependent on the relationships between specific teachers.

Inclusion implications and limitations. As a Participatory Action Research project, the research study has a clearly established action plan, which is to provide effective inclusive practices for struggling learners. The research study illustrated how a push-in program can be effective for students by reducing stigma surrounding struggling learners. One of the most emotional and enlightening part of the research study was the students' reactions of being positioned right outside the boundary of the classroom. The purpose of the positioning of the students was to create an extended learning environment, not to segregate the students, but the interpretation of the students was that there was a separation and that separation was due to their lack of ability in mathematics (Researcher Notes, Lesson 1, Gr.5; Teacher Notes, Gr.5).

Students are acutely aware that they are being segregated and students do feel stigmatized when relocated to a separate learning environment. Research on the negative aspects of the pull-out model is discussed in a research study by Woodward & Talbert-Johnson (2009). Although the study involved reading intervention in the United States, the intervention model is the same and the experiences of the students directly relates to the experiences of the students in the research study. Woodward and Talbert-Johnson

(2009) report that socialization is a negative aspect of a pull-out program because students were removed from peers resulting in self-esteem issues because the child "starts to realize they go to" a separate location for a reason that excludes them from their peers (p.195). In the grade 6/7 classroom, the issue of stigma was a social issue. An example from the research study that addresses student perception of LART assistance is the one student in the intervention group that has a sister with exceptionalities. The grade 6 student resisted 'help' from the LART because of the fear of being "labelled" or "embarrassed" (Researcher Notes, Session 3, Gr.6/7; Woodward & Talbert-Johnson, 2009). Once I started working with her inside the classroom, our relationship developed and she was confident in asking for assistance in her learning and saw my presence in the classroom as positive not stigmatizing

Another limitation to the push-in model is the school district and school administration's support of inclusion practices. The push-in model cannot be implemented if the administration is not in support of push-in practices. I was very fortunate that I had two administrators who trusted my judgement and respected my professional autonomy of knowing how to provide best services to struggling learners. I also had conversations with the Superintendent of Schools in our district, and they fully supported the research study and wants further dialogue to continue on how we can improve inclusion practices in our school district. Since the push-in model is not a common practice, there is limited research from Canada that discusses the effectiveness of a push-in program, which is why this research study may be used to create not only dialogue but action plans for better inclusive practices in our schools. I agree with Moore (2016) that "Inclusion is not about integrating students by housing them into (or out of)

forced containers of classrooms and schools" (p.17). A school should be inclusive throughout the building for students and professionals.

Vision for the future. This research study has demonstrated important findings in the areas of Growth Mindset, push-in model of inclusion, and the effectiveness of mathematic interventions applied in a co-teaching classroom student success. As a researcher and a teacher, I appreciated the opportunities and the support I was given to proceed with new research in the field of education, but I feel that this research is only the beginning of a larger vision.

Growth Mindset is a positive approach to student learning, but it is an approach that needs to be strengthened by further application of learning opportunities. It is not enough to teach positive statements, students need extended opportunities to journal and reflect about their experiences and opportunities to talk about their learning (Boaler, 2016; Parrish, 2014). If a teacher is teaching Growth Mindset statements but has multiple- choice exams and students fail at their attempts at learning, Growth Mindset will fail. Teachers need to have a Growth Mindset and multiple strategies to ensure that students will feel that failure is a first attempt at learning.

Providing a collaborative teaching model and Growth Mindset approach in the subject area of mathematics is also a beginning of a mathematics intervention model. When I provide student services inside the general mathematics classroom, I am aware of further issues that may be more serious than a belief about self-esteem. A student may perceive to have a Fixed Mindset but could actually have math anxiety or a specified learning disability in mathematics.

Math anxiety can lead to a “global avoidance pattern” which can include withdrawing from attempts at learning and negative self-esteem (Chinn, 2012, p.2). An example of one of the students in the research study that demonstrated math anxiety traits was the student in the grade 6/7 class that did not complete the first Math Reflections sheet. As a teacher and a LART, I will want to monitor the student and create a plan with the general teacher to address the avoidance and anxiety traits that are presenting.

It is important to note that Growth Mindset, although important and helpful for many students struggling with math, is not a sufficient intervention for children with profound math challenges resulting from a specified math learning disability. A specified learning disability in mathematics can be described as “severe impairments in the acquisition of mathematical skills” (Mammarella, Caviola, Cornoldi & Lucangeli, 2013, p. 13). Students with a specified learning disability in mathematics may have difficulty solving arithmetic, spatial reasoning, and decoding (Emerson & Babtie, 2010; Mammarella, Caviola & Szucs, 2017). These issues are more severe than a belief in ability. In each of these examples, additional intervention beyond a Growth Mindset approach will be needed for a student’s success; thus, a Growth Mindset approach can be used as a complimentary, but not main approach to address difficulties in mathematics.

Using the push-in model in the general mathematics classroom created rich experiences for mathematic learning and mathematical thinking. Having the LART directly involved in the general mathematics classroom can create a mathematical environment where dialogue is encouraged, ideas are celebrated, mistakes are just a first draft, and problem solving is a tool for learning. The teaching of mathematics has shifted from the rote learning, pass or fail, experience into a way of teaching problem solving

and critical thinking. My hope is that by working collaboratively, teachers and LARTs can use each other's knowledge to create a mathematical classroom that is an inclusive "thinking classroom". Liljedahl (2016) explains that a "thinking classroom" is "conductive to thinking but also occasions thinking, a space inhabited by thinking individuals thinking collectively, learning together and constructing knowledge and understanding through activity and discussion" (p.3). In an inclusive thinking classroom professionals and students will discuss curriculum goals and use multiple modes of learning which include: vertical surfaces, reflective journaling, number talks, and problem based learning activities that celebrate the success of learning, instead of paper and pencil tasks that focus on the ability of accuracy (Boaler, 2013; Boaler, 2016; Calkins, 1996; Liljedahl, 2016; Parrish, 2014).

I recognize that as a researcher and a teacher I was very fortunate to have the support of using a push-in model to provide student services. I am the only LART in our school district that uses a push-in model as the main instructional method of delivering student services. The more common model used is the pull-out model. There are several reasons that may prevent the push-in model from being successful, the main barrier being lack of support, either fiscally or philosophically. If the caseloads and student needs are quite demanding, the LART needs to work with students in crisis. That is the priority of the job. If there are not enough certified educational assistants to support students in the classroom, then it is the LART that may be pulled to assist students. The LART needs to be supported professionally for the LART to be supportive in the classroom.

While recognizing the benefits of push-in models of learning support, it is also critical to appreciate the positive aspects of a pull-out model including reduction of noise,

smaller groups, individual attention, and ability grouping (Bean et al., 1991; Barton, 2016; Jones, 2002; Woodward & Talbert-Johnson, 2009). Whereas the findings reveal that the benefits of a push-in model outweigh those of a pull-out model, it is important to recognize unique situations in which support through pull-out would be required. I acknowledge that there are times where a pull-out short term intervention is valuable, and I do pull individual students to work one to one; however, pulling out a student should require careful consideration and done only when strictly necessary; it should be the exception rather than the rule in models of instructional support. In fact, because the push-in model is the prime method of delivering students services at the schools where I work, when I do pull a student to work one-to-one it is often more effective. Because I have already established the relationship with the student in the classroom, the location of my assistance is fluid, not stigmatizing.

It is also important to recognize that when using the push-in model, there may be many barriers to professional collaboration including support from administration and school districts, personality conflicts, scheduling, and adapting to shared space (Murawski, 2008; Schnellert & Butler, 2014). These challenges were all addressed effectively at various points during the research study presented in this report. Therefore, they did not become barriers in the research project. In fact, this research project presents many positive aspects of collaboration that directly addresses overcoming barriers that can be suggestions for future implications for teachers and teacher education.

Implications for teachers. The implications of the study directly relate to applying a Growth Mindset approach to education, and the implementation of collaboration amongst teachers, including a push-in model in all subject areas. It is essential that when applying a Growth Mindset approach, the focus is the process of learning, not the accuracy and ability of the learner. Applied to mathematics, the Growth Mindset approach is a shift from traditional rote learning, where speed and correct responses were paramount compared to differentiated learning and scaffolding knowledge. Mathematics is a subject that often creates anxiety about failure. Reducing anxiety by celebrating thinking and problem solving can create "mathematicians" in every classroom; the classroom teacher does not have to do it alone.

The findings from this study corroborate those of Schnellert and Butler (2014) indicating that teacher collaboration could be empowering for teachers as it directly relates to their own professional development of inquiry. Teachers can co-plan, and communicate with each other about, not only the learning process of the students in the classroom, but also about their own learning process. For example, the grade 6/7 teacher and I had that special moment together when we were discussing the division of zero question on a worksheet. Instead of tackling the problem alone, we involved the class and directed the class into our own process of inquiry. By happenstance, the grade 6/7 teacher and I were engaging in a transformative teaching practice called Teacher Time Out (Gibbons, Kazemi, Hintz & Hatmann, 2017).

The practice of Teacher Time Out encourages teachers to plan lessons together with the intent to "pause" a lesson and to "think aloud, share decision-making with one another, and/or determine where to steer direction" (p.28). When the grade 6/7 teacher

and I paused the class and shared the responsibility of scaffolding the learning together, the students were informally witnessing the collaborative teaching strategy of Teacher Time Out. The grade 6/7 teacher and I have plans to formally adopt the strategy and implement it in future math classes.

Collaboration creates communities of learners and should be supported in schools by administration and all members of the professional team. Communication, thinking, and problem solving must be collaborative and teachers should be encouraged to continue to learn from each other inside and outside of their own classrooms.

Application to universal design for learning and response to intervention. The inclusive nature of this study and the quantitative data has implications for direct applications of two pedagogical approaches to education, which is Universal Design for Learning (UDL) and Response to Intervention (RTI). The purpose of UDL is to achieve full inclusion for individuals with different abilities and to provide equitable access by eliminating discriminatory practices (Dalton, Lyner-Cleophas, Ferguson & McKenzie, 2019). UDL applied to education removes barriers for individuals with different abilities by promoting multiple modes of learning, multiple representations of learning (visual, auditory), and multiple ways of expressing ideas based on the needs of all learners in the classroom (Dalton, Lyner-Cleophas, Ferguson & McKenzie, 2019; Katz, 2013). Having the LART become a collaborative partner in the general classroom encourages UDL because the classroom teacher receives mentorship and coaching on how to apply differentiated instruction based on the needs of the students (Katz, 2013). If a teacher incorporates UDL in their classroom, then there is a natural application of using the push-in model of intervention to enhance the learning of all students.

Response to Intervention (RTI) facilitates inclusion because it is based on the framework of providing specific interventions for pro-active academic interventions, as well as, targeted interventions for specific learners (Grosche & Volpe, 2013). RTI asks the questions: Is the intervention working? If not, then why? RTI encourages a collaborative approach to designing and implementing interventions based on tiers of supports for individuals in the general classroom, small groups, and individuals who benefit from research-based targeted instruction with a specialist teacher (Grosche & Volpe, 2013). This research study can be directly applied to a RTI approach in regards to using the Growth Mindset quantitative data. In this research study, the results of the Growth Mindset Questionnaire could be used to analyze effective interventions and guide teachers to further instructional goals. If a Growth Mindset approach is interpreted as a successful intervention, then a collaborative team can work together to develop curriculum in response to the data. Individual students can also be looked at to determine whether there is a greater need for targeted intervention (example: the student who exhibited traits of math anxiety who may need one to one support). Teachers and schools who use a RTI model can incorporate aspects of this research study (Growth Mindset Questionnaire, My Math Reflection sheets) to promote Growth Mindset in the general classroom; while simultaneously promoting inclusion.

Implications for teacher education. I was very fortunate that during my practicum experience for the Bachelor of Education program, I had the opportunity to collaborate and co-teach. There were two teachers that opened the doors between their classrooms, and learning opportunities became fluid with students and teachers crossing the physical and pedagogical boundaries at different times. The result of having two

teachers mentoring me early in my career shaped how I view professional collaboration and may have influenced the successful collaborations experienced int this study. From my mentors, I learned about the benefits of collaboration for both the learners and the teachers. If teacher education presented more opportunities for teacher candidates to be mentored in collaborative teaching, they might develop the skillset to implement co-teaching techniques in their own classrooms.

My vision for future schools is to establish full inclusion where general teachers, specialists, and all staff and students, work collaboratively in schools to create a learning environment that welcomes everyone through not only the front door but through all doors.

Conclusion

The main purpose of this study was to examine the effectiveness of providing mathematical interventions for struggling learners of mathematics within the classroom setting using the push-in model. Examination of a collaborative teaching model between the classroom teacher and the Learning Assistant Resource Teacher (LART), the research study focused on children from grades four to seven and their teachers within a Participatory Action Research framework. Both quantitative and qualitative data collection enabled comprehensive and robust insights into the research issue. Quantitative data methods included the Growth Mindset Questionnaire and Qualitative data collection included teacher, student, and researcher reflections, as well as, final interview answers provided by the teacher participants.

The results of the research study, supported by both the quantitative and the qualitative components, suggest that there was an increase in the Growth Mindset of struggling learners. The results of the qualitative research through inductive coding resulted in themes associated with the experiences of the participants in the push-in model of intervention such as: stigma, professional vulnerability, curriculum fragmentation, and collaborative teaching. These themes parallel past research on the positive aspects of a push-in intervention. The research study was unique in that it also included research in the area of mathematics where the push-in method and Growth Mindset approach was applied by the LART in the general mathematics classroom. The positive relationships that developed within the general math classroom reinforced a

positive approach to mathematics that encouraged mathematical thinking and critical thinking.

The findings from this study are significant and create the foundation for opportunities to further explore collaborative teaching in a push-in model of learning support as a model of inclusion and how providing access to specialists in the general classroom can influence all learners. The opportunity to examine how the push-in model of intervention and Growth Mindset approach can be applied to the general mathematics classroom was an example of how LARTs and general teachers can work together in a common space to benefit all learners.

Concluding Thoughts

One important factor in the research study that continued to be unsettling for me was the term "push-in" model. The literature uses the terms "push-in" and "pull-out" models to explain the common practices associated with providing student services to exceptional learners inside or outside of the general classroom. The term "push-in" feels aggressive. My intention is not to push colleagues into having me support learners in the general classroom. I want teachers to "pull-me-into" their classrooms. I want them to view my role as the Learning Assistance Teacher as one that will enhance the classroom experience. Throughout this research study, the teachers did pull me into their daily classroom experiences. For this reason, the term "pull-in" model of collaborative instruction is more appropriate in capturing the intent of the professional relationship examined in this study.

Through inclusive collaboration, quantitative and qualitative research reinforced that when given the support, methods and models of education can be successfully

changed to an informed action (praxis). The praxis of this research study relates to Paulo Freire's (2005) definition of praxis, where the action of using the push-in model is directly linked to the values of inclusion and Growth Mindset. Praxis is also evident in the need to create a community of learners in our schools where everyone (general teachers, exceptional learners, all professionals) belongs, feels safe, and demonstrates an "I can" attitude (Brownlie & King, 2011, p.21). The dialogue relating to the evidence presented in this research study needs to be examined amongst school staff teams, all educational stakeholders, and future researchers on the collaborative models of intervention with the intention to reach all students' needs **within the regular classroom with their peers.**

This research study unveiled several unexpected and remarkable themes that created evidence for the possibility for teachers to work together towards a common vision of creating an effective "pull-in" model, making full inclusion a reality.

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Appendix A

Name: _____

Math teacher: _____

Math Attitude Survey

	Very true	A little true	Not true	Very true	A little true	Not true
1. I enjoy learning math	○	○	○	2	1	0
2. I use math every day	○	○	○	2	1	0
3. Math is boring	○	○	○	0	1	2
4. I like challenging problems	○	○	○	2	1	0
5. There is only one right way to solve math problems	○	○	○	0	1	2
6. Mistakes help me learn	○	○	○	2	1	0
7. I am a mathematician	○	○	○	2	1	0
8. I learn best when my teacher tells me the exact steps to follow	○	○	○	0	1	2
9. I am comfortable talking about my mathematical thinking	○	○	○	2	1	0
10. It bothers me to get a wrong answer	○	○	○	0	1	2
11. I am good at math	○	○	○	2	1	0
12. I like to figure things out on my own	○	○	○	2	1	0
13. I can learn from other students	○	○	○	2	1	0
14. I make mental pictures when I read math problems or numbers	○	○	○	2	1	0
15. Students who get better grades than me are smarter than me	○	○	○	0	1	2

Appendix B

THOMPSON RIVERS UNIVERSITY

August 28, 2018

Mrs. Andrea MacKenzie
Faculty of Education and Social Work
Thompson Rivers University

File Number: 101902
Approval Date: August 28, 2018
Expiry Date: August 27, 2019

Dear Mrs. Andrea MacKenzie,

The Research Ethics Board has reviewed your application titled 'Inclusive Collaboration: Increasing Mathematic Achievement and Growth Mindset in the General Classroom'. Your application has been approved. You may begin the proposed research. This REB approval, dated August 28, 2018, is valid for one year less a day: August 27, 2019.

Throughout the duration of this REB approval, all requests for modifications, renewals and serious adverse event reports are submitted via the Research Portal. To continue your proposed research beyond August 27, 2019, you must submit a Renewal Form before August 27, 2019. If your research ends before August 27, 2019, please submit a Final Report Form to close out REB approval monitoring efforts.

If you have any questions about the REB review & approval process, please contact the Research Ethics Office via 250.852.7122. If you encounter any issues when working in the Research Portal, please contact the Research Office at 250.371.5586.

Sincerely,
Joyce O'Mahony
Chair, Research Ethics Board

Appendix C

SCHOOL DISTRICT NO. 73 (KAMLOOPS/THOMPSON)
1383 - 9th Avenue, Kamloops, BC V2C 3X7 • Tel: (250) 374-0679 • Fax: (250) 372-1183

September 27, 2018

via email: amackenzie@sd73.bc.ca

Andrea MacKenzie
c/o Logan Lake Elementary and Secondary Schools

Dear Andrea;

Re: Thesis Project Proposal

I am writing to approve your request to conduct a research project involving students at Logan Lake Elementary and Secondary Schools to support your thesis project, which will focus on improving mathematical achievement involving a collaborative teaching initiative between teachers and the student services department. Participation in this project by students, parents and teachers will be strictly voluntary.

I have attached a copy of Board Policy #809.1 for our reference. Please review this policy before conducting your project.

I look forward to seeing your completed thesis.

Sincerely,

Alison Sidow
Superintendent

AS:dh

cc: R. Schoen, Assistant Superintendent
B. Hamblett, Assistant Superintendent
T. Smillie, Director – Elementary Education and Learning Services
R. Collins, Principal – Logan Lake Elementary and Secondary

Appendix D

SCHOOL DISTRICT NO. 73 (KAMLOOPS/THOMPSON)

POLICY 809.1

Effective Date, October 20, 2008

SURVEYS AND QUESTIONNAIRES (NON-MINISTRY)

The Board of Education recognizes the value of research studies within the District and authorizes the Superintendent, or designate, to grant or deny requests to carry out such research, surveys, questionnaires, and related projects in keeping with the following regulations.

REGULATIONS

1. The Superintendent, or designate, will evaluate and rule on research and other projects in the schools according to the following criteria:

    a) There should be a clear benefit to the District or the greater educational community.

    b) The conduct of the research should cause minimal disruption to schools and should not be detrimental to relationships with the community.

    c) The research should be sponsored and guided by a school district, post-graduate department of a university, or recognized research institution.

    d) All reasonable steps should be taken in conducting the research to ensure that parents/guardians are informed in advance of all aspects of the research that bear directly on them or their children. Parents/guardians will determine if their children will be permitted to participate in any authorized research project or survey.

    e) The District, and/or individual school, will preview and approve any communication regarding such research sent home to parents/guardians.

2. School principals are authorized to evaluate and rule on school and/or classroom specific research and other projects in keeping with the above regulations.

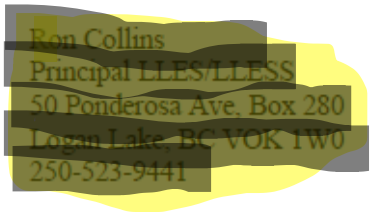
Appendix E

Good afternoon Andrea,

I have reviewed your research project proposal and the attached consent forms that you had forwarded to me. I am very excited and honoured that you have chosen our Logan Lake schools to conduct your research in. I look forward to you working with our staff and students on this exciting numeracy project. I am very interested in reviewing your findings and incorporating the findings in our School Learning Plan. If you require any assistance during the project I am more than willing to assist in any way.

Please accept this email as my approval to conduct your research at our schools. Should you require a formal letter please let me know and I will provide such.

Sincerely,



Appendix F

Informed Consent for Minors by Parent, Guardian, and/or Other Appropriate Authority to Participate in a Research Project or Experiment

Thompson Rivers University

805 TRU Way
Kamloops, BC
V2C 0C8
Telephone
(250)-828-5000

Note: The University, and those conducting this project, subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form, and the information it contains, is given to you for your own protection and full understanding of the procedures, risks and benefits involved.

I have been asked by Andrea MacKenzie of the Faculty of Education and Social Work at Thompson Rivers University, telephone number 250-851-8785, to consent on behalf of (name of child)_____, to participate in a research project entitled: Inclusive Collaboration: The Use of the Push-In Model of Intervention and Growth Mindset Approach in the General Mathematics Classroom.

The purpose of the research is to explore how providing student services within the general classroom will increase mathematic achievement and improve Growth Mindset in Mathematics for learners who require additional support in mathematics. The research will also provide reflective feedback from the students and the teachers regarding the collaborative learning opportunity of having the Learning Assistant Teacher provide interventions within the general classroom. All students will also have access to additional support within the classroom by the Learning Assistant Teacher. The teacher and Mrs. MacKenzie will both have access to the data. The data collected will also be part of a thesis publication.

I certify that I understand the procedures to be used. I have tried as fully as possible to explain the procedures to (name of child): _____ and to obtain the subject's consent. If the subject displays any sign of distress or reluctance to participate in any aspect of this research she/he will be withdrawn from the research procedure, and this will be brought to my attention.

I also understand that I may ask any questions or register any complaint I might have about the project with either the chief researcher named above or with Dr. Gloria Ramirez (Associate Professor School of Education, Faculty of Education and Social Work, TRU) Gramirez@tru.ca or by contacting the chair of the TRU Ethics Committee TRU-

REB@TRU.ca or 250-828-500. Copies of the results of this study, upon its completion, may be obtained by contacting: Mrs. Andrea MacKenzie (amackenzie@sd73.bc.ca or 250-851-8785)
I agree that my child will participate by being a member of the classroom where the Learning Assistant Teacher will collaboratively work with the general teacher during mathematic instruction as described above, during the period: September 2018 to January 2019 XXXXXX Elementary and XXXXX Elementary/Secondary.

NAME (Please print): _____

ADDRESS: _____

_____

I have read and understood the above information regarding this project, voluntarily agree to participate in the project, and understand that I have the right to withdraw my consent at any time. I understand that the subject's identity and any information obtained will be kept confidential through the process of coding student identity instead of providing names. All data collected will be kept in a locked filing cabinet at the school for up to five years and any information will be shredded.

Please check the boxes below that apply:

☐ I have received a copy of this consent form and a subject feedback form.

☐ I authorize that my child to participate in the research study.

☐ I do not authorize that my child to participate in the research study.

SIGNATURE: _____ DATE: _____

RELATIONSHIP TO SUBJECT: _____

Appendix G

Thompson Rivers University

900 McGill Road
Box 3010
Kamloops, BC
V2C 5N3
Telephone
(250) 828-5000

Informed Consent by Teachers Participating in the Research Project

Inclusive Collaboration: The Use of the Push-In model of Intervention and Growth Mindset Approach in the General Mathematics Classroom

Note: The University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of participants. This form and the information it contains is given to you for your own protection and full understanding of the procedures, risks and benefits involved in this research project.

This consent form, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more details, feel free to ask anytime. Please take the time to read this carefully and to understand any accompanying information.

I have been asked by Mrs. Andrea Mackenzie, Graduate student in the Faculty of Education and Social Work of Thompson Rivers University, telephone number 250-851-8785, to participate in a research project entitled: Inclusive Collaboration: The Use of the Push-In Model of Intervention and Growth Mindset Approach in the General Mathematics Classroom

- The study will involve working collaboratively with the Learning Assistant Teacher within the designated math instructional time. I will have students participate in a Growth Mindset Questionnaire at the beginning and at the end of the research project.
- I will work with Mrs. MacKenzie to identify students who need additional math interventions and collaborate with Mrs. MacKenzie regarding effective interventions for the students that she will teach within the classroom. The students requiring additional support will also record reflections in a Growth Mindset Journal.
- As part of the research I will also be providing reflective responses to the collaborative teaching process using a double entry journal and I will participate in an interview at the end of the research project.

- My participation and any information gathered from me will be kept confidential. To guarantee this, my name will be replaced with a pseudo name (chosen by myself) on all data protocols as soon as data is collected. Folders containing my information will be always kept under close vigilance by the researcher and will be stored in a locked filing cabinet at the researcher's office. The research team will not share my information with anybody outside the research team; only members of the research team will have access to this data. Information that will potentially identify me will never appear in study reports; instead, general descriptors and pseudonyms will be used. Electronic files and databases will be secured with a login password with access only to the researcher and the classroom teacher. Data will be shredded, and electronic files deleted after three years of concluding the study.
- It is anticipated that participating in this research will bring benefits for my school community as it opens an opportunity for professional development. It will open a space for reflection, dialogue and discussion on issues related to professional collaboration, inclusive learning, Growth Mindset, and effective instructional practices. At the end of the study, the researcher will offer a summary report to share with the teachers at my school the insight gained from the study. Results will also be presented at professional and academic meetings and will be published in academic journals. I will be invited to take part in presentations and written publications. Copies of the results of this study, upon its completion, may be obtained by sending a request by email to Dr. Gloria Ramírez at gramirez@tru.ca.

My signature on this form indicates that I understand the information regarding this research project, including all procedures and the personal risks involved, and that I voluntarily agree to participate in this project.

I understand that my identity and any identifying information obtained will be kept confidential.

I understand that I may refuse to participate or withdraw my participation in this project at any time without consequence. My involvement or non-involvement in this project is in no way related to my employment contract.

I also understand that I may ask any questions or register any complaint I might have about the project with either the chief researcher Andrea MacKenzie amackenzie@sd73.bc.ca or by telephone at 250 851-8785, or with Dr. Gloria Ramirez, Associate Professor in the School of Education within the Faculty of Education and Social Work at Thompson Rivers University by telephone 250-371-5565.

I have received a copy of this consent form and a Subject Feedback form.

Name (Please Print):

_____

Address:

_____

_____

Signature: _____ Date: _____

Investigator and/or Delegate's signature: _____ Date: _____

……

Appendix H

Research Project:
Inclusive Collaboration: The Use of the Push-In Model of Intervention and Growth Mindset Approach in the General Mathematics Classroom

Researcher: Mrs. Andrea MacKenzie
Final Interview Questions

1. What do you feel are the main strengths of working collaboratively with the Learning Assistance Teacher in the classroom?
1. What do you feel are the main weaknesses of working collaboratively with the Learning Assistance Teacher in the classroom?
2. What did you learn from participating in the research project?
3. Can you reflect on student achievement in your classroom in regards to the last twelve weeks?
4. Could you briefly reflect on the student's Growth Mindset during the research project?

Appendix I

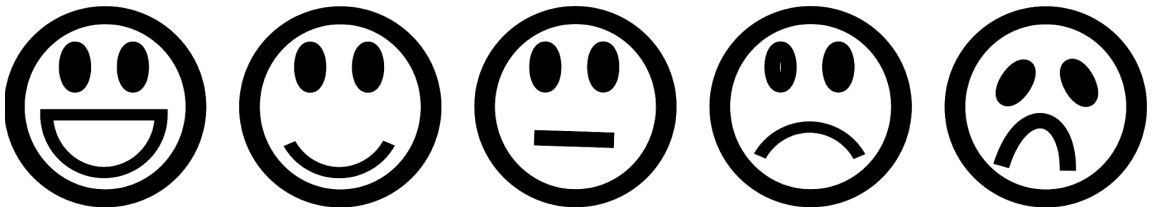
Name: _____ Date:_____

My Math Reflections

I am doing well with… I still need help with…

Math connection I made today… My Math goal…

Self-Assessment



Appendix J

BCTF statement of professional rights and autonomy

(November 2007)

Teachers have the professional right and autonomy:

1. to establish the teaching and learning environment including setting standards of behaviour and using classroom management strategies that best suit the needs of students and teachers
2. to use discretion in carrying out their professional responsibilities and primary control in diagnosing learner needs, planning and delivering curriculum, and determining appropriate methods of instruction to meet those needs
3. to use primary control over assessment and over the interpretation and communication of evaluation data in regard to students
4. to use significant influence over curriculum development, learning resource evaluation and selection, policy formulation, and other decision-making through the school staff at the school level, through locals at the district level, and through the BC Teachers' Federation at the provincial level
5. to a working environment, that supports the judgments and choices that teachers make in order to carry out their professional responsibilities, and is free from administrative procedures or supervision practices that limit or undermine their professional autonomy
6. to significant opportunities and resources to organize and engage in professional development activities, which address their self-determined professional needs and interests
7. to advocate for the rights of children and adult students
8. to have unrestricted participation in union activities

Appendix K

Beginning and Ending Reflections

(Note: First example student did not submit a beginning reflection)

Name: _____ Date

My Math Reflections

I am doing well with...	I still need help with...
Subtractions Addition	Long Division
Math connection I made today...	**My Math goal...**
Money	Get better at everything Long Division
Self Assessment of the day	

Name: ___ Dat

My Math Reflections

I am doing well with...	I still need help with...
Adding with regrouping	Mini's regrouping
Math connection I made today...	**My Math goal...**
Blocks to number	To do a mini's question with regrouping

Self Assessment of the day

great good OK not so bad

Name: ___ Date:

My Math Reflections

I am doing well with...	I still need help with...
Adding +	Division
Math connection I made today...	**My Math goal...**
Cutting pizza in to equal groups.	Division

Self Assessment of the day

Name: Date:

My Math Reflections

I am doing well with...	I still need help with...
Learning in groups	big subtraction numbers
Math connection I made today...	**My Math goal...**
touch Math	big subtraction numbers
Self Assessment of the day	

Great Good OK Not OK Help

Name: Date:

My Math Reflections

I am doing well with...	I still need help with...
touch math	times tables
Math connection I made	**My Math goal is...**
touch math	to get better at times tables
Self Assessment of the day	
good	

Great Good OK Not OK Help

Name:

Date: _____

My Math Reflections

I am doing well with...	I still need help with...
Dinson.	Multiplication
Math connection I made today...	**My Math goal...**
No	is to be good at Multiplcation

Self Assessment of the day

This

Name:

Date: _____

My Math Reflections

I am doing well with...	I still need help with...
Getting to work fast	Son Math Questions
Math connection I made today...	**My Math goal...**
I get to very very fast	be very [illegible]

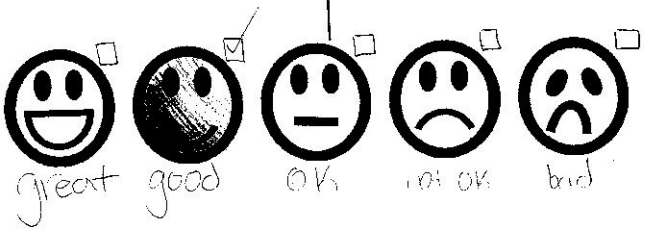
Self Assessment of the day

Name: Date: _

My Math Reflections

I am doing well with...	I still need help with...
+ adding whith regruping	- subtracting whith boroing
Math connection I made today...	**My Math goal...**
braving taly marks, IIII IIII	- to get better at subtracting whith boroing

Self Assessment of the day

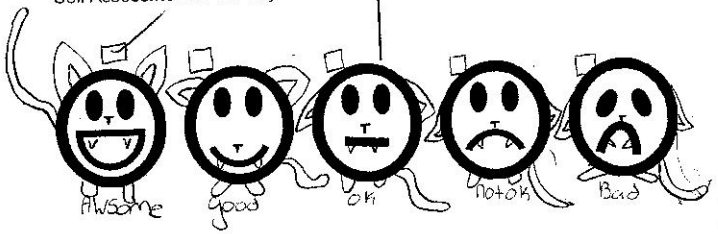


Name: Date:

My Math Reflections

I am doing well with...	I still need help with...
I am doing well in adishon 	I realy need to work on my division. 
Math connection I made today...	**My Math goal...**

Self Assessment of the day

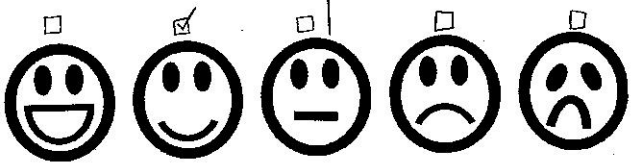


Name: Date:

My Math Reflections

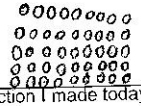
I am doing well with...	I still need help with...
adding.	minis regrouping.
Math connection I made today...	**My Math goal...**
Drawing talies.	I want to finish my math on time.

Self Assessment of the day

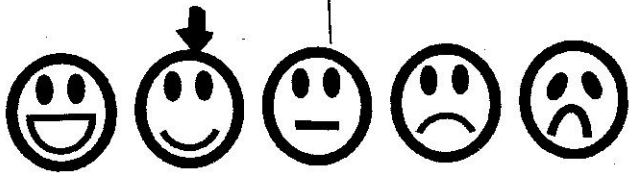


Name: Date:

My Math Reflections

I am doing well with...	I still need help with...
My Mutlpluction and arrays. Because I was not good with Multpluction in grade 3. 5x9=45? 	Subtracting big numbers.
Math connection I made today...	**My Math goal...**
	My math goal is to get better with subtracting by the end of next week.

Self Assessment of the day



Name: _____ Date _____

My Math Reflections

I am doing well with... Math Division

I still need help with... Writing

Math connection I made today...

Math is my favorite

My Math goal... To learn math

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with... Math Addition

I still need help with... Times. 100's

Math connection I made today...

I can pass a cartwheel

My Math goal... To write neat

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with...

Math

I still need help with...

multiplication

Math connection I made today...

teach math to my family.

My Math goal...

to get better at everything

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with...

Drawing place value pic

I still need help with...

2d multiplication

Math connection I made today...

counting money

My Math goal...

getting better at multiplication

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with...	I still need help with...
pl with times	double double
Math connection I made today...	**My Math goal...**
touch points	is division
Self Assessment of the day	

Name: _____ Date: _____

My Math Reflections

I am doing well with...	I still need help with...
double digits in times	subtraction because I'm not used to it
Math connection I made today...	**My Math goal...**
don't know estimation addition	get better at subtraction 128-48
Self Assessment of the day	

Name: [redacted] Date: [redacted]

My Math Reflections

I am doing well with... Addition

I still need help with... multiplication

Math connection I made today...

to the books

My Math goal...

figure out the problem of life

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with...

double digit times

I still need help with...

double digit divocah

Math connection I made today...

when I did divocah it remind me of adding

My Math goal...

to solve 48-5200x48=

Self Assessment of the day

Name: [redacted]

My Math Reflections

Date: [redacted]

I am doing well with...

[redacted]

I still need help with...

multiplication facts

Math connection I made today...

Dubai Fun ball.

My Math goal...

Mrs Shen

Self Assessment of the day

Name: [redacted]

My Math Reflections

Date: [redacted]

I am doing well with...

I am doing good at multiplying.

I still need help with...

I still need help at division.

Math connection I made today...

3 2 1
x 1 2 3
3 6 3

My Math goal...

multiply 5 digit numbers.

Self Assessment of the day

Name: [redacted] Date:

My Math Reflections

I am doing well with... multiplication facts

I still need help with... long division

Math connection I made today... Money/decimals

My Math goal... to learn long division

Self Assessment of the day

Name: [redacted] Date

My Math Reflections

I am doing well with...

I still need help with...

Math connection I made today... I counted lots of money in place value

My Math goal...

Self Assessment of the day

Name: [redacted] Date:

My Math Reflections

I am doing well with...	I still need help with...
+ x	-
Math connection I made today...	**My Math goal...**
counting more x in my head	to do better
Self Assessment of the day	

Name: Date: [redacted]

My Math Reflections

I am doing well with...	I still need help with...
addition single digit +	division 20 ÷ 5
Math connection I made today...	**My Math goal...**
[illegible]	do more division with bigger numbers
Self Assessment of the day	

Name: _____ Date _____

My Math Reflections

I am doing well with...	I still need help with...
÷ x + −	A little with x Long division
Math connection I made today...	**My Math goal...**
Money	multiply 6 7 8 9 x
Self Assessment of the day	

Name: _____ Date _____

My Math Reflections

I am doing well with...	I still need help with...
+ − ÷	x6 x7 x8 x9
Math connection I made today...	**My Math goal...**
mapping	get good at x6 x7 x8 x9
Self Assessment of the day	

Name: _____ Date: _____

My Math Reflections

I am doing well with...	I still need help with...
Nothing	

Math connection I made today...	My Math goal...
Money with number	to do better

Self Assessment of the day

Name: _____ Date: _____

My Math Reflections

I am doing well with...	I still need help with...
Nothing	

Math connection I made today...	My Math goal...
Nothing	Nothing

Self Assessment of the day